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VOL I of III

160377

RCRA Facility Assessment Report



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Protection Agency**
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1631210006 - St. Clair County
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RCRA File
PERMIT

Page

500

LIST OF TABLES

<u>No.</u>	<u>Name</u>
1	Categories of Wastes Managed at Monsanto
2	List of SWMUs and Corresponding Recommendations
3	RCRA Part A Application Revisions
4	List of Agency BOW and BOA Permits
5	Summary of Groundwater Monitoring Results

LIST OF FIGURES

<u>No.</u>	<u>Name</u>
1	SWMU Locations
2	Site Location (State)
3	Site Location (Regional)
4	Extent of Monsanto Facility
5	Residential Population - 2 Mile Radius
6	Public Water Supply Surface Water Intakes
7	Regional Industrial and Municipal Groundwater Well Locations
8	Facility Groundwater Monitoring Well Locations
9	Locations of Air Quality Monitoring Stations
10	Air Quality Monitoring Schematic
11	Facility Sewer System

1631210006 - St. Clair County
RFA

Monsanto
EM

LIST OF ATTACHMENTS

<u>No.</u>	<u>Name</u>
A	Agency August 26, 1991 Draft RCRA Part B Application Denial
B	February, 1992 Consent Order
C	Facility Boring and Groundwater Well Logs
D	Urban Air Toxics Monitoring Program Summary
E	Facility Emissions Inventory
F	VSI SWMU Characteriation Worksheets
G	VSI Photographs

2015

Sept, 1992

I. Executive Summary

A. Preface

In accordance with 35 IAC Section 724.201, the owner or operator of a facility seeking a permit for the treatment storage or disposal of hazardous waste must institute corrective action as necessary to protect human health and the environment for all releases of hazardous waste or constituents from any solid waste management unit at the facility regardless of the time at which waste was placed in the unit. The purpose of the RCRA Facility Assessment (RFA) is to determine whether Solid Waste Management Units (SWMUs) exist at the W.G. Krummerich Plant in Sauget, Illinois, and to characterize and assess the release potential of each unit.

In accordance with guidance established for RCRA Facility Assessments (RFAs), a "Solid Waste Management Unit" is defined as:

"Any discernible waste management unit at a RCRA facility which hazardous constituents might migrate, irrespective of whether the unit was intended for the management of solid and/or hazardous waste", including, but not limited to, (1) containers, (2) tanks, (3) surface impoundments, (4) waste piles, (5) land treatment units, (6) landfills, (7) incinerators, (8) underground injection wells, (9) recycling units, (10) wastewater treatment units, and (11) areas contaminated by "routine, systematic, and deliberate discharges from process areas".

This definition includes all units defined as "regulated units" and units which EPA has generally exempted from standards applicable to waste management units. All SWMUs identified at the facility may be subject to remedial investigations and activities under Corrective Action, depending upon the release potential of the unit.

The RCRA Facility Assessment process consists of two distinct components: a preliminary file review, and a site inspection. The file review and site inspection are conducted in order to obtain data on (1) the unit characteristics, (2) characteristics of waste managed at the unit, (3) potential pollutant migrations pathways, (4) investigate whether there is evidence of a release, (5) assess the exposure potential of the wastes based upon the characteristics of the unit.

Information obtained from the file review and site inspection will be compiled in a RCRA Facility Assessment Report, which will be used by the Agency to determine which SWMUs require Corrective Actions, and as an aid in determining which environmental media require corrective action investigations.

B. Facility Description

The Monsanto W. G. Krummerich Plant is a chemical manufacturing facility which primary product lines include industrial chemicals, chemical intermediates, agricultural intermediates and rubber chemicals. Hazardous wastes generated from facility operations include F-, K-, P- and U-list wastes, and waste which are characteristically hazardous (D-wastes). A list of wastes and approximate annual quantity of currently managed at Monsanto, with corresponding EPA Hazardous Waste Code numbers, is provided as Table 1.

Review of Agency files, historical information, and information obtained from the Visual Site Inspection (VSI) were compiled to form a list of Solid Waste Management Units at this facility. A list of the SWMUs identified at this facility is provided in Section III of this document, and includes a detailed characterization of each of the SWMUs identified at this facility. The location of each SWMU with respect to the facility boundaries is shown on Figure 1.

C. Recommendations

Based upon the review of the information acquired and summarized for this facility, the Agency has made recommendations regarding environmental media investigations for each of the SWMUs identified through the preliminary review and the Visual Site Inspection. Due to space limitations, a summary of the Agency recommendations for each SWMU is provided in Table 2 of this document.

The Agency considers the AOCs identified in this document to be potential waste management units, and as such, subject to Corrective Action requirements. Therefore, Monsanto will be required to conduct AOC unit investigations as part of the Corrective Action portion of the facility permit in order to determine if these AOCs are indeed waste management units. If these areas are determined to be Solid Waste Management Units, Monsanto will be required to conduct Corrective Action investigations to determine if the units have impacted environmental media, and initiate corrective measures, if necessary.

II. General Description

A. Facility Description

The Monsanto W.G. Krummerich Plant, located within St. Clair County in Sauget, Illinois, is a manufacturer of chemical products, including industrial chemicals, chemical intermediates, agricultural intermediates, and rubber chemicals. The facility address is:

Monsanto Company
W.G. Krummerich Plant
500 Monsanto Avenue
Sauget, Illinois 62206-1198

The Krummerich site was acquired by Monsanto as an operating facility in 1917. This facility was formerly known as the Commercial Acid Company, which manufactured sulfuric acid, zinc chloride, chlorosulfonic acid and sodium sulfate.

The facility lies within a heavily industrialized area. Currently, this facility presently employs approximately 600-700 people. Monsanto is bounded by a number of operating manufacturing facilities and communities including:

Communities

Village of Sauget
City of East St. Louis
Village of Centerville
Village of Alorton

Industries

Sterling Steel Castings
Cerro Copper
Mineweld, Inc.
Phillips Petroleum Bulk Terminal
Clayton Chemical Company
Trade Waste Incineration
Cahokia Marine Services
Big River Zinc Company
Ethyl Petroleum Additives, Inc.
Mobil Oil Company

Total plant acreage is approximately 314 acres, of which 111 acres are in use. The location of this site, with respect to the State of Illinois and the region, is shown in Figures 2 and 3. The extent of the Monsanto Company property is shown in Figure 4. Apparently, as land around the facility became available, Monsanto purchased these lots in an effort to have property available to expand operations. Currently, the Monsanto facility consists of a total of 15 distinct lots (i.e., Lots A, B, C, D, E, F, G, H, I, K, and additions to

these lots). For the purposes of this RFA, all lots except for Lot I will be investigated. The contiguity of the property identified as Lot H to the main manufacturing facility (i.e., Lots B and C) is questionable; therefore, SWMUs identified at this location will be noted, yet future Corrective Actions for these SWMUs may not be required by the Agency.

Over the course of operations at this facility, Monsanto has manufactured a wide variety of chemicals, both organic and inorganic. It is likely that no complete list exists outside the company files. A number of wastes resulting from manufacturing operations have been identified through review of plant products and off-site waste shipments, including:

1. Spent halogenated and non-halogenated solvents
2. E.P. Toxicity and TCLP wastes
3. Mercury contaminated wastes
4. Chlorobenzenes and other benzene compounds
5. Phenols and other phenolic compounds
6. Phosphorus and other phosphoric compounds
7. Polychlorinated biphenyls (PCBs)
8. Dioxins and dioxin precursors
9. Aromatic nitro compounds
10. Aromatic amines and nitroamines
11. Chlorinated aromatic hydrocarbons
12. Aromatic and aliphatic carboxylic acids
13. "Agent Orange"
14. Maleic Anhydride
15. Acids and caustics

B. Waste Management Operations

Monsanto began operations at this facility in 1917. Product manufacturing operations at this facility have changed since that time, with numerous product lines being started and eliminated due to consumer demand. Currently, several product lines in the plant result in the generation of RCRA hazardous wastes, with the primary waste streams categorized as follows: chlorobenzene distillation residues, chlorobenzene spent carbon, chemical spills, MIAK/MIBK distillation residues, nitrochlorobenzene "high boilers" waste streams, off-specification phosphorus pentasulfide, and wastes generated from on-site laboratories.

Monsanto is currently pursuing a RCRA Part B permit for operation of four RCRA hazardous waste management units located in the facility's main manufacturing area. These units are identified as (1) the BBU waste storage warehouse, (2) the Ketone residue storage tank, (3) the Spent Carbon treatment tank, and (4) the High Boiler treatment tank. A listing of the wastes which Monsanto proposes to store or treat in these units is identified and listed in Table 1.

This listing is compiled from the latest facility RCRA Part B application submittal. Agency files indicate that a number of RCRA regulated units have been in operation at this facility in the past. Additionally, as product lines are phased out, RCRA wastes have also been removed from the waste stream for this facility. However, Monsanto is not pursuing permitted status for any wastes or units not identified above.

C. Regulatory History

On November 18, 1980, Monsanto submitted a RCRA Part A application to the USEPA. This Part A application was revised a total of nine times in order to delete and identify additional hazardous waste streams and hazardous waste management units at this facility. A listing of Monsanto's RCRA Part A application revisions, dates, and a brief summary of the revision to the application is compiled in Table 3.

The Agency called in Monsanto's RCRA Part B permit application in a letter dated February 2, 1990. The Agency conducted a review of the application, and responded with a Notice of Deficiency (NOD) on July 20, 1990. A revised permit application was submitted to the Agency on December 13, 1990, and the Agency responded with a NOD on February 15, 1991. Monsanto provided the Agency with a revised submittal on June 26, 1991. The Agency responded to this third revision with a draft RCRA Part B permit denial dated August 26, 1991. A copy of the Agency's draft RCRA Part B denial letter is shown as Attachment A to this RFA. The Agency and Monsanto are currently conducting negotiations in order to resolve the deficiencies noted in the Agency's draft permit denial letter.

The W.G. Krummerich facility has obtained permits for wastewater pre-treatment and air emissions from the Agency's Bureau of Water and Air, respectively. A summary of these permits is provided in Table 4.

D. Compliance History

A review of Agency files indicates that numerous violations have been alleged against Monsanto in the past. Noted violations included manifest discrepancies, financial assurance violations, container/tank labeling violations, operating record violations, maintenance of job training records, closure certification violations, tank inspection violations, interim status closure violations, and tank system operation violations, all of which the Agency and Monsanto have resolved. At the time of this RFA, the facility was noted to have two outstanding violations: 35 IAC 724.251 and 725.243(e)(3), both noted to be violations of financial assurance regulations.

In February 13, 1991, Monsanto and the State of Illinois entered into a Consent Order by which Monsanto agreed to conduct remedial investigations, a corrective action feasibility study, and initiate remedial activities at the Lot H landfill (also known as the "Sauget Toxic Dump", "Site R Landfill", and the "River's Edge Landfill"). A copy of this Consent Order is shown as Attachment B to this RFA. At the time of this RFA, groundwater remedial investigations, including a treatability study, were being initiated by Monsanto at the Lot H landfill.

E. Environmental Setting

1. Potentially Exposed Populations

Monsanto is located in a heavily industrialized and populated area of the St. Louis Metropolitan East area of Illinois. The residential population within a 2 mile radius (see Figure 5) of the Monsanto W.G. Krummerich Plant is in excess of 70,000. This population estimate does not include residential or commercial areas within the City of St. Louis, Missouri, although they lie within this area. Since the Monsanto facility lies within an industrialized metropolitan area, potentially exposed population has a tendency to increase during the normal work hours (approximately 7:00 AM to 6:00 PM) due to migration of workers to employers in these areas.

2. Public Water Supply

The locations of all wells identified in this RFA are based upon information taken from Illinois State Geologic Survey, Illinois State Water Survey, Illinois Department of Public Health, and Illinois Environmental Protection Agency databases and files.

Public water supply for the communities surrounding the Monsanto facility are derived from surface water sources, specifically the Mississippi River. The communities surrounding Monsanto, which include East St. Louis, Sauget, Centerville and Cahokia, all purchase their water for public use from the Illinois American Water Company of East St. Louis. The water intakes for this facility are both located upstream from the Monsanto facility on the Mississippi River (see Figures 6a and b).

Private groundwater wells are also present in a large number in this area. From review of available information, Monsanto has conducted numerous geologic and hydrogeologic investigations over the course of operations. Copies of available boring logs and groundwater well logs are provided as Attachment C.

Many regional groundwater withdrawal wells installed for industrial and manufacturing use are located in the vicinity of the Monsanto facility. The locations of these wells are noted in Figures 4, 5 and 6. Information is not available for the Agency to determine whether these wells are used to provide potable water supply to manufacturing or industrial firms utilizing these wells.

3. Regional Hydrogeology

The W.G. Krummerich plant is situated on the flood plain of the Mississippi River, south of East St. Louis, in Sauget, Illinois. The flood plain is locally named the American Bottoms, and contains unconsolidated valley fill deposits composed of recent alluvium (Cahokia Alluvium), which overlies glacial material (Henry Formation). These unconsolidated deposits are underlain by bedrock of Pennsylvania and Mississippian age which consists of limestone and dolomite with lesser amounts of sandstone and shale.

Groundwater exists in both the Cahokia Alluvium and Henry Formation valley fill material under water table and leaky artesian conditions. These strata have been classified as a single hydrogeologic unit due to the hydrologic connectivity exhibited between strata and the lack of significant confining layers between or within the individual strata. Although the Mississippian bedrock formations immediately below the valley fill also contain groundwater, the relatively lower permeability of these formations and poor water quality with depth generally preclude their use as an important aquifer in the area.

Schict (1965) and Bergstrom (1956) indicate that the combined effect of variations in grain size (coarsening with depth) and degrees of sorting within the valley fill have caused the hydraulic conductivity (permeability) of the valley fill to increase with depth. These variations in conductivity affect the groundwater flow system and ultimately the transport of contaminants within the area. To facilitate the hydrogeologic evaluation of the area, the valley fill has been divided into three zones - shallow, intermediate, and deep - based upon relative hydraulic conductivities. These zones have been assigned based upon the lithology described in boring logs in the literature and aquifer test results compiled by Schict (1965). Descriptions of the three zones are as follows:

Shallow Zone

This relatively lower conductivity zone is composed of the coarse alluvial (silty sand) deposits found below the surficial fine-grained silt and clay. The zone extends from

the water table to a depth of approximately 45 feet below the ground surface and averages 35 feet in thickness. Hydraulic conductivities, determined from slug tests data from monitoring wells finished in this zone, averaged 4.6×10^{-3} cm/sec. The natural discharge point for this zone is the Mississippi River.

Intermediate Zone

This zone includes the medium- to coarse-grained sand and gravel deposits of the Henry Formation and extends from 45 to 75 feet below the surface. Hydraulic conductivity values for this zone were determined to be approximately 1.1×10^{-1} cm/sec. The discharge point for this zone is the Mississippi River.

Deep Zone

This zone includes the coarsest deposits of the Henry Formation, which directly overlie the bedrock. The zone extends from 75 feet to approximately 120 to 130 feet below the surface. Reported values of hydraulic conductivity are approximately 1.4×10^{-1} cm/sec. The ultimate discharge point for this zone is the Mississippi River.

4. Site Hydrogeology

Geologic information obtained during various drilling programs conducted in the vicinity of the W.G. Krummerich plant indicate that the unconsolidated deposits are approximately 110 feet thick at the site. These deposits have been categorized into three hydrogeologic zones, according to relative transmissivities. A fine-grained low-transmissivity zone is present from the land surface to about 40 feet below grade, a more permeable intermediate zone is located between 40 and 90 feet, and a deep zone that contains the most permeable material lies between 90 feet and bedrock.

The geology of the shallow unconsolidated deposits beneath the facility is characterized by fill material overlying clay, which is underlain by fine sand. A generalized hydrogeologic cross section was developed with sample/core log data obtained during past and recent drilling programs to depict site geology with respect to topography and groundwater elevations. The investigations depict saturated fine sand deposits under confined conditions as determined by the presence of a clay lens which varies in thickness from 10 to 14.5 feet in the southeastern portion of the plant. Approximately 6 feet of fill material was found above the clay. The fill consists chiefly of crushed stone, graded sand and gravel, and cinder.

Water level measurements made in December 11, 1989 in five groundwater monitoring wells utilized for the purpose of RCRA

closure indicate a water level elevation approximately 21 to 22 feet below grade. Horizontal groundwater flow components indicate groundwater flows generally in a westerly direction towards the Mississippi River.

Groundwater elevation measurements conducted at the site indicate that a groundwater mound exists beneath the W.G. Krummerich plant process area. The source of this mounding is unclear to the Agency, and at this time has not been adequately addressed by Monsanto.

This facility is located in an area which groundwater flow is affected by the Mississippi River. Normal groundwater flow is in a westerly direction - towards the river. Industries in the area have conducted pumping activities which have caused two cones of depression to be created, which resulted in reversing the flow away from the river towards the site. The pumping was noted to have reached its peak in the 1960's. Due to less production and the poor quality of the water, pumping diminished in the 1970's.

Due to the characteristics of both the regional and site hydrogeology, a case can be made that the aquifer underlying this facility meets the definition of a Class I hydrogeologic unit under 35 IAC 620 Groundwater Quality Standards. At this time, Monsanto has not developed nor conducted a detailed hydrogeologic investigation to determine the appropriate hydrogeologic classification (e.g., Class I, Class II, etc.) under 35 IAC 620.

5. Vadose Zone Contamination

A February 10, 1984 letter from Monsanto to the Agency indicated that soil sampling activities were conducted at various locations throughout the plant site to determine the quality of the vadose zone soils. A total of 46 soil samples were collected at a maximum depth interval of 8-10 inches. Sample analytical results indicated that the soils were contaminated by the parameter 2,3,7,8-TCDD.

Soil samples collected for the purpose of RCRA closure of the Chlor-Alkali waste pile pad indicated that contamination by the constituent Mercury were present. Remedial activities by Monsanto (excavation of soils contaminated above established facility cleanup objectives) and verification sampling indicate that contaminant concentrations of the compound Mercury no longer exists in this area in excess of 10 ppb.

Due to the number of Solid Waste Management Units identified at this site (see below), contamination of the vadose zone soils at this facility is expected to be present, however, the horizontal and vertical extent of such contamination has not been determined at this time.

6. Groundwater Quality

Monsanto has installed an expansive facility groundwater monitoring system at the W.G. Krummerich facility. Figure 7 shows the locations of the groundwater monitoring wells installed on Monsanto property. Monsanto has indicated that a facility groundwater monitoring program has been conducted in an effort to determine the quality of the groundwater flowing under this facility. Groundwater monitoring wells installed for the purposes of RCRA closure of the hazardous waste management Chlor-Alkali unit are included in this facility groundwater monitoring system. However, Monsanto has not provided the Agency with information on well installation, sampling procedures and frequencies, and analytical results which provide and indication of the groundwater quality as determined by this expansive facility groundwater monitoring system at this time.

The results of chemical analyses of the groundwater collected on December 12 and 13, 1989 from five groundwater monitoring wells for RCRA closure activities associated with the Chlor-Alkali waste pile indicate that quantifiable concentrations of volatile organic compounds (VOCs), semi-volatile compounds (SVOCs), pesticides, polychlorinated biphenyls (PCBs), metals and miscellaneous compounds are present in the groundwater underlying this facility. Specifically, the following parameters have been detected in the groundwater at this facility during RCRA closure activities:

Benzene	Phenol
Methylene chloride	Toludine
Chlorobenzene	Aniline
Chloroform	2-Chlorophenol
2-Nitrophenol	Nitrobenzene
1,2-Dichlorobenzene	Nitrophenol
Dieldrin	Cyanide
Aroclor 1242	Sulfide

A copy of the analytical results for the December 1989 groundwater monitoring activities is included as Table 5. It is noted that this list may not identify all compounds which presently exist in the groundwater underlying this facility at this time. Further sampling and analysis is necessary to determine the on- or off-site sources, rate and extent of groundwater contaminant plumes at this facility.

Regional groundwater quality is noted to be poor due to past waste management practices in the area. A May 1988 environmental assessment report entitled, "Expanded Site Investigation, Dead Creek Project Sites at Cahokia/Sauget, Illinois, Final Report", prepared by Ecology and Environment, details available information on past disposal practices in the Sauget area. Groundwater sampling and analytical activities conducted in the area indicate that the

groundwater underlying a large portion of the Sauget/Cahokia area is has been impacted by industrial disposal practices. Analytical results detect contamination of the area groundwater by volatile organics, metals, hydrocarbons, PCBs, dioxins, pesticides, and numerous other organic, inorganic and miscellaneous parameters and compounds. It appears that groundwater contamination from other industrial sites has the potential to impact groundwater at the W.G. Krummerich facility due to regional and local groundwater flow gradients.

7. Regional Air Quality

The measurement of regional air quality in the St. Louis Metropolitan East (Metro East) area is based upon air quality monitoring conducted by USEPA and IEPA. The Agency obtained information for the purpose of this RFA from the 1991 Illinois Annual Air Quality Report and the Agency's 1988 Urban Air Toxics Monitoring Program. The monitoring program for the Metro East area includes a number of monitoring stations located in Madison County and St. Clair County. The locations of the two monitoring stations closest to the Monsanto W. G. Krummerich facility are shown in Figure 9.

Air quality in the Metro East area was below the state average for parameters which were routinely monitored, including carbon dioxide (CO), sulfur dioxide (SO₂), ozone (O₃), and the Pollutant Standards Index (PSI). (The Pollutant Standards Index is a indicates the highest critical pollutant for a given sampling event). Figure 10 provides a graphic depicting the percentage of occurrences in which the routinely monitored pollutants rated (i.e., unhealthy, moderate, good) in the Metro East area in the latest year. Air quality ranged from moderate to unhealthy approximately 30 - 40 percent of the time in the Metro East area for sulfur dioxide and ozone. (It is noted that this graphic does not provide information on particulate matter monitoring).

Air toxics data was collected from a IEPA monitoring station located on Little Avenue in Sauget, Illinois. A copy of the Urban Air Toxics Monitoring Program summary for the referenced monitoring trailer in Sauget, Illinois for the years 1988 through 1990 is provided as Attachment D to this document. In general, it appears that the concentrations for most toxics listed drops over the provided time period. However, it is also noted that the number of sampling events also drops over the time period. At this time there are no regulatory limits promulgated for air toxic concentrations; therefore, the concentrations of air toxics for this region cannot be compared to a regulatory health-based number.

Attachment E provides a copy of an emissions inventory for the W. G. Krummerich facility compiled by the Agency's Bureau of Air. This inventory provides a current account of all

1631210006 - St. Clair County
RFA

Monsanto
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permitted emissions for the facility for volatile organic compounds, particulate matter, nitrous oxides, and carbon monoxide. Measurements are provided for maximum and average volumes of these compounds emitted from the facility.

III. Description of Solid Waste Management Units

A total of 69 Solid Waste Management Units were identified during the preliminary investigation and Visual Site Inspection conducted at the Monsanto facility. A total of 19 Areas of Concern were also identified during the preliminary review; however, Agency representatives were not able to conduct inspections for each of the AOCs due to time constraints.

The Agency considers the AOCs potential waste management units, and as such, subject to Corrective Action requirements. Therefore, Monsanto will be required to conduct AOC unit investigations as part of the Corrective Action portion of the facility permit in order to determine if these AOCs are indeed waste management units. If these areas are determined to be Solid Waste Management Units, Monsanto will be required to conduct Corrective Action investigations to determine if the units have impacted environmental media, and initiate corrective measures, if necessary.

In order to determine if a particular SWMU is ranked as a high, medium or low priority for environmental media, certain general criteria were applied to the unit conditions:

1. If a unit is a suspected land disposal unit, release potential to soils and groundwater are considered high priority. For all other units, until available information proves otherwise, groundwater priority will be considered low.
2. If a unit is an outdoor unit, or storage of wastes in containers or tanks occurred over pavement or on an earthen surface, the release potential for soil is considered a medium priority.
3. If a unit is open to the atmosphere and manages wastes which contain, or may contain, volatile organics as a constituent, the release potential for air is considered high or medium priority. Otherwise, the priority for air release was considered low priority.
4. If a unit has history of releases to environmental media, the unit will be considered to be a high or medium priority for those environmental media which appear to have been impacted by the release.
5. If the Agency has certified RCRA closure of the unit, then the priority for all environmental media is considered low.

Each of the SWMUs identified in the following section are ranked according to priority for the following environmental

media: Soils, Groundwater, and Air. After each recommendation, how the above criteria were applied to the SWMU will be identified. (For example, SWMU #20 is a suspected landfill unit. Under the section marked conclusions, the media listed should read, "Soil: high priority (1)". The number in the parenthesis indicates which of the above criteria where applied to this recommendation.)

The Areas of Concern were not ranked due to lack of information regarding unit location and characterization. As noted above, Monsanto will be required to conduct investigations to determine if the AOCs are indeed Solid Waste Management Units as a condition to the facility permit.

SWMU No.: #1

Unit Name: Phenol Recovery Process Tank

Unit Description: This unit was located in the Chlor-Alkali Wastewater Treatment Unit (SWMU #4), located in the southeastern corner of the main manufacturing area. This unit was included on the facility's RCRA Part A application, and was identified as Item 405. The construction of this unit was not specified. The area is currently a gravel covered with no structures or buildings apparent. Groundwater monitoring wells have been installed in this area for the purpose of RCRA closure of the Chlor-Alkali waste pile.

Date of Start Up: Assumed to be the same as the start-up date of the Chlor-Alkali wastewater treatment unit. The Chlor-Alkali wastewater treatment unit was permitted for construction by the Agency DWPC in 1978.

Date of Closure: Assumed to be the same as the date of dismantling of the Chlor-Alkali wastewater treatment plant. The date of closure was not specified.

Wastes Managed: The wastes managed by this unit were liquid phenolic wastes. No EPA Hazardous Waste Code number was specified.

Release Controls: Construction of the unit is unknown; therefore, information pertaining to release controls is also unknown;

History of Releases: There is no information available regarding releases from this unit.

Conclusions: Soils: medium priority (2)
Groundwater: low priority (1)
Air: low priority (3)

SWMU No.: #2

Unit Name: Phenol Recovery Process Tank

Unit Description: This unit was located in the Chlor-Alkali Wastewater Treatment Unit (SWMU #4), located in the southeastern corner of the main manufacturing area. This unit was included on the facility's RCRA Part A application, and was identified as Item 400. The construction of this unit was not specified. The area is currently a gravel covered with no structures or buildings apparent. Groundwater monitoring wells have been installed in this area for the purpose of RCRA closure of the Chlor-Alkali waste pile.

Date of Start Up: Assumed to be the same as the start-up date of the Chlor-Alkali wastewater treatment unit. The Chlor-Alkali wastewater treatment unit was permitted for construction by the Agency DWPC in 1978.

Date of Closure: Assumed to be the same as the date of dismantling of the Chlor-Alkali wastewater treatment plant. The final date of dismantling of the pre-treatment unit was January 1988.

Wastes Managed: The wastes managed by this unit were liquid phenolic wastes. No EPA Hazardous Waste Code number was specified.

Release Controls: Construction of the unit is unknown; therefore, information pertaining to release controls is also unknown;

History of Releases: There is no information available regarding releases from this unit.

Conclusions: Soils: medium priority (2)
Groundwater: low priority (1)
Air: low priority (3)

SWMU No.:	#3
Unit Name:	Phenol Recovery Process Tank
Unit Description:	This unit was located in the Chlor-Alkali Wastewater Treatment Unit (SWMU #4), located in the southeastern corner of the main manufacturing area. This unit was included on the facility's RCRA Part A application, and was identified as Item 209. The construction of this unit was not specified. The area is currently a gravel covered with no structures or buildings apparent. Groundwater monitoring wells have been installed in this area for the purpose of RCRA closure of the Chlor-Alkali waste pile.
Date of Start Up:	Assumed to be the same as the start-up date of the Chlor-Alkali wastewater treatment unit. The Chlor-Alkali wastewater treatment unit was permitted for construction by the Agency's DWPC in 1978.
Date of Closure:	Assumed to be the same as the date of dismantling of the Chlor-Alkali wastewater treatment plant. The date of final dismantling of the pre-treatment unit was in January 1988.
Wastes Managed:	The wastes managed by this unit were liquid phenolic wastes. No EPA Hazardous Waste Code number was specified.
Release Controls:	Construction of the unit is unknown; therefore, information pertaining to release controls is also unknown;
History of Releases:	There is no information available regarding releases from this unit.
Conclusions:	Soils: medium priority (2) Groundwater: low priority (1) Air: low priority (3)

SWMU No.: #4

Unit Name: Mercury Recovery Process

Unit Description: This unit was a totally enclosed pre-treatment and treatment system. This system was used to treat process wastewaters to reduce mercury content before discharge. This unit also received leachate from the Chlor-Alkali waste pile for treatment. The system consisted of a central waste collection basin, constructed of concrete, with dimensions 13 X 8 X 13 feet and an approximate capacity of 10,000 gallons. Wastewaters were then pumped to one of two existing 400,000 gallon steel surge tanks before treatment. The treatment system consisted of one 35 foot ID by 13 3/4 foot deep clarifier, and one 12 foot ID by 13 foot reactor with 11,000 gallon capacity. The daily average flow of the system was 130,000 gallons, with a maximum daily flow of 210,000 gallons. The treatment system piping consists of 10 or 18 inch diameter acid brick or vitrified clay piping. Discharges went to the Village of Sauget sewer system. Construction and operation of this treatment system was initially permitted by the Agency's DWPC under permit number 1978-EE-2347.

Date of Start Up: The Agency's DWPC permitted construction and operation of this treatment system in November of 1978.

Date of Closure: Monsanto ceased operations of this treatment unit before March 11, 1987. The pre-treatment system was dismantled before January 13, 1988.

Wastes Managed: This unit treated process wastewaters contaminated with mercuric compounds and gyp sulfide treatment residues. The sludges generated from treatment of the wastewaters was a hazardous waste.

Release Controls: Details regarding construction of this unit are not available to the Agency at this time. Therefore, any release controls for this unit are unknown:

History of
Releases:

There is no information available regarding
releases from this unit.

Conclusions:

Soils: medium priority (2)
Groundwater: low priority (1)
Air: low priority (3)

SWMU No.: #5

Unit Name: Dept. 229/230 Steamer Overhead Tank

Unit
Description: This unit was a 14,000 to 15,000 gallon capacity tank, located in the area of Departments 219 and 222. This unit had a 12 foot OD, with a 14 1/2 foot length.

Date of
Start Up: The date of start-up of this unit was not specified.

Date of Closure: This unit was taken out of service in 1982.

Wastes Managed: The waste managed by this unit were ignitable wastes generated from the distillation of butyl benzyl phthalate, and was composed of the following compounds: butanol, benzyl chloride, and triethylamine.

Release
Controls: Available information indicated that diking was present around this unit.

History of
Releases: There is no information available regarding releases from this unit.

Conclusions: Soils: medium priority (2)
Groundwater: low priority (1)
Air: low priority (3)

SWMU No.: #6

Unit Name: Benzyl Chloride Residue Tank

Unit
Description: This unit was located in the area of the CCI Building on the west side of the main manufacturing plant. This unit serviced Departments 229 and 230. The unit had a capacity of 15,000 gallons. The area where this unit was formerly located is covered with asphalt and Building CCI. This unit was dismantled on an emergency basis by Monsanto after a the tank ruptured.

Date of
Start Up: The date of start-up for this unit was not specified.

Date of Closure: The date of closure of this unit was not specified.

Wastes Managed: The wastes managed by this unit were not specified; assumed to be benzyl chloride or related compounds.

Release
Controls: Construction of the unit is unknown; therefore, information pertaining to release controls is also unknown;

History of
Releases: This unit was removed from service due to a tank rupture. Information regarding impact to environmental media from this rupture was not available.

Conclusions: Soils: high priority (4)
Groundwater: medium priority (4)
Air: low priority (3)

SWMU No.: #7

Unit Name: Department 224/233 Drum Storage Area

Unit Description: This unit was located to the north of Department 224 and 233. This unit is a drum accumulation area for the two above referenced departments. The pavement of the unit is constructed partially of concrete and asphalt. The pavement of the unit is sloped towards the road. Wastes are managed in 55-gallon metal containers, fiber drums, and plastic containers.

Date of Start Up: The date of initiation of operation of this unit was not specified.

Date of Closure: This unit was in operation on the date of the Visual Site Inspection.

Wastes Managed: The wastes managed by this unit are containerized wastes, including materials which are to be reworked. The types of wastes managed at this unit were not specified.

Release Controls: This unit was not bermed, and there was spill residues evident on the pavement of the unit.

History of Releases: There is no information available regarding releases from this unit. Spill residues were evident on the pavement of the unit at the time of the VSI.

Conclusions: Soils: medium priority (2)
Groundwater: low priority (1)
Air: low priority (3)

SWMU No.: #8

Unit Name: Department 237 Tank Storage Unit

Unit

Description: This SWMU consists of two tank units located in Department 237, on the northeast side of old Department 237. These units are located approximately 15 feet apart. The capacity of each of the units is 20,000 gallons. The northern-most tank is identified as Item 410, and the other is identified as Item 210. The tank pads are constructed of concrete. Wastes from these tanks are loaded into tankers for off-site incineration.

Date of Start Up: The date of start-up of these tanks is not specified, although these units were in operation in 1979.

Date of Closure: These units were closed in 1981.

Wastes Managed: The tank identified as 410 managed waste residues from the Department 237 still pot. The tank identified as Item 210 managed waste residues from Department 239.

Release Controls: These units did not have secondary containment present.

History of Releases: There is no information available regarding releases from these units.

Conclusions: Soils: medium priority (2)
Groundwater: low priority (1)
Air: low priority (3)

SWMU No.: #9

Unit Name: Department 245 Drum Storage Area

Unit Description: This unit is located in the area of Department 245. This unit manages containers holding wastes, but mainly manages containers holding material which will be reworked. The pavement of this unit is concrete, with no secondary containment present. Monsanto representatives stated that the concrete pavement was approximately 1 year old. The approximate configuration of the unit is approximately 45 feet by 80 feet.

Date of Start Up: The initial date of operation of this unit was not specified. Monsanto representatives stated that this unit had been in operation since the late 1950's.

Date of Closure: This unit was active at the time of the VSI.

Wastes Managed: Monsanto representatives stated that only off-specification phosphorus pentasulfide (a material with the consistency of a powder) had been stored in this area.

Release Controls: No secondary containment was present in the are of the unit.

History of Releases: There is no information available regarding releases from this unit.

Conclusions: Soils: medium priority (2)
Groundwater: low priority (1)
Air: medium priority (3)

SWMU No.: #10

Unit Name: MIBK Residue Tank

Unit
Description: This unit was in Department 247/235. This tank unit had a 15,000 gallon capacity.

Date of
Start Up: The date of initiation of operation of this unit was not specified.

Date of Closure: The date of cessation of operations for this unit was not specified.

Wastes Managed: The wastes managed by this unit were identified as methyl isobutyl ketone residues.

Release
Controls: Construction of the unit is unknown; therefore, information pertaining to release controls is also unknown.

History of
Releases: There is no information available regarding releases from this unit.

Conclusions: Soils: medium priority (2)
Groundwater: low priority (1)
Air: low priority (3)

SWMU No.: #11

Unit Name: Paint Shop Drum Accumulation Area

Unit Description: This unit was located near the corner of 3rd and E Street in the main manufacturing facility. Wastes were managed in containers stored directly on the pavement. Monsanto representatives stated that the pavement cover was blacktop at the time that the container storage area was in use. The area is currently covered with gravel. The area in which containers were stored was approximately 60 feet by 60 feet.

Date of Start Up: No specific date which operations initiated was referenced; Monsanto representatives stated that this area accumulated wastes for at least 12 years.

Date of Closure: Operations at this unit ceased between 1988 and 1989.

Wastes Managed: The wastes managed by this unit were paint wastes and thinners, typically liquid materials.

Release Controls: This unit did not have secondary containment present at the time of the VSI.

History of Releases: There is no information available regarding releases from this unit.

Conclusions: Soils: medium priority (2)
Groundwater: low priority (1)
Air: low priority (3)

SWMU No.: #12

Unit Name: Laboratory Waste Accumulation Area

Unit Description: This unit is located north of the facility laboratory. The container storage area is caged, with a roof overhand. No berms are present. The pavement is of concrete construction. The concrete base was not level. Wastes were stored in 55 gallon containers and 10 gallon fiber drums. Wastes were also lab packed for disposal.

Date of Start Up: The specific date which operations initiated at this unit was not referenced; the laboratory has been operating at this location since 1966.

Date of Closure: Over 90 day storage in this area ceased in 1985.

Wastes Managed: The wastes managed by this unit were contaminated solvents (flammable), glass, and nitrochlorobenzene wastes (both hazardous and non-hazardous).

Release Controls: This unit did not have secondary containment at the time of the VSI.

History of Releases: There is no information available regarding releases from this unit.

Conclusions: Soils: medium priority (2)
Groundwater: low priority (1)
Air: low priority (3)

SWMU No.: #13

Unit Name: Warehouse/Shipping Drum Accumulation Area

Unit
Description: This unit is located on the northwest corner of 3rd and I Street at the facility. The unit has a concrete base. Wastes were stored in containers. A minimum of 204 drums (34 pallets) were accumulated at one time. Wastes were contained in 20 gallon fiber drums. Wastes from this area were shipped to Baton Rouge, Louisiana for disposal.

Date of
Start Up: The date of initiation of operations of this unit was not specified; Monsanto representatives stated that this area had been in operation since at least 1983.

Date of Closure: The date of closure of this unit was not specified; Monsanto representatives indicated that this unit ceased operations in 1987.

Wastes Managed: The wastes managed at this unit were non-hazardous process wastes from Department 255.

Release
Controls: Secondary containment was not evident at this unit during the VSI.

History of
Releases: There is no information available regarding releases from this unit.

Conclusions: Soils: medium priority (2)
Groundwater: low priority (1)
Air: low priority (3)

SWMU No.: #14

Unit Name: BBU Warehouse

Unit Description: This unit is located in the southwestern portion of the main manufacturing facility. This unit is of corrugated metal construction with a six-inch concrete base. A one foot concrete berm is present along the perimeter of the pavement. The pavement is divided by a six-inch concrete berm installed for the purpose of segregating incompatible wastes. Wastes are stored in 66-gallon overpack drums, 55-gallon steel drums, and 20- and 10-gallon fiber drums, and placed on wooden pallets. The estimated maximum capacity of the unit is 2900 drums. The maximum permitted (RCRA Part A) capacity is 400,000 gallons. Forklifts are used to transport the wastes into and from the unit.

Date of Start Up: The date of initiation of operations of this unit was not specified.

Date of Closure: This unit was active at the time of the VSI. Monsanto intends to pursue permitted status for this unit.

Wastes Managed: This unit has managed a wide variety of wastes. Currently, all wastes identified in Table 1 of the RFA which have an S01 Handling Code are managed in the BBU Warehouse.

Release Controls: This unit has a one foot berm surrounding the perimeter of the concrete base. The entrances to the buildings are not closed to the elements.

History of Releases: There is no information available regarding releases from this unit.

Conclusions: Soil: medium priority (2)
Groundwater: low priority (1)
Air: medium priority (3)

SWMU No.: #15

Unit Name: Ketone Residue Tank

Unit Description: This unit is located in the northwestern portion of the main manufacturing area, in Department 277. This unit is identified as Item 595. This unit is of metal construction, and rests on a concrete base. This unit is located in a tank farm with three other tank units, none of which were in operation at the time of the VSI. The pavement of the tank farm was sloped to a sump, which drained into SWMU #43. The tank farm is surrounded by a dike approximately four feet in height. This unit is equipped with liquid level gauges, a nitrogen blanket, and a high level alarm. Wastes from this unit are pumped into tankers before being shipped to Trade Waste Incineration for treatment.

Date of Start Up: This tank was scheduled to start-up in 1986; prior to this date this unit may have been used to for purposes other than waste management.

Date of Closure: This unit has not been closed. Monsanto is pursuing RCRA Part B permitted status for this unit.

Wastes Managed: This tank unit stores a process waste which includes the compounds methyl ethyl ketone and methyl isobutyl ketone.

Release Controls: As noted above, secondary containment for this unit is provided by a concrete berm approximately 4 feet in height. Additionally, this unit is equipped with a high level alarm.

History of Releases: Review of Agency files indicates that a release to the secondary containment system occurred; however, the release was not from this unit.

Conclusions: Soil: medium priority (2)
Groundwater: low priority (1)
Air: low priority (3)

SWMU No.: #16

Unit Name: Department 247 Ketone Residue Tank

Unit
Description: This unit was located in the south-central portion of the main manufacturing plant, in Department 247. This unit was identified as Item 232. This tank unit was of metal construction and had a capacity of 3000 gallons. The tank unit was located over a concrete or asphalt pavement. Wastes were pumped from this unit to tankers for disposal. A RCRA Part B tank assessment conducted on this unit recommended that repairs be conducted on this tank before wastes be stored. Monsanto opted to remove this tank from service and replace it with SWMU #16 above. The Agency approved closure certification for this unit on June 14, 1989.

Date of
Start Up: The date of initiation of operation of this unit was not specified.

Date of Closure: The Agency approved certification of closure in a June 14, 1989 letter to Monsanto.

Wastes Managed: This unit managed liquid wastes which included the compounds methyl ethyl ketone and methyl isobutyl ketone.

Release
Controls: There is no available information regarding a release controls for this unit.

History of
Releases: There is no information available regarding releases from this unit.

Conclusions: Soil: low priority (5)
Groundwater: low priority (5)
Air: low priority (5)

SWMU No.: #17

Unit Name: Department 247 Ketone Reside Tank

Unit
Description: This unit was to be located in the south-central portion of the main manufacturing plan, in Department 247. This unit was identified as Item 268. This tank unit was of meal construction, and had a capacity of 2250 gallons. The tank unit was located over either asphalt or concrete pavement. A RCRA Part B tank assessment recommended that repairs be conducted before this unit stored wastes. Monsanto opted to remove this unit from service and replace it with SWMU #16 above. The Agency approved closure certification on June 14, 1989.

Date of
Start Up: The date of initiation of operation of this unit was not specified.

Date of Closure: As referenced above, the Agency approved certification of closure for this unit on June 14, 1989.

Wastes Managed: This unit managed liquid wastes which included the compounds methyl ethyl ketone and methyl isobutyl ketone.

Release
Controls: No information regarding release controls for this unit is available.

History of
Releases: There is no information available regarding releases from this unit.

Conclusions: Soil: low priority (5)
Groundwater: low priority (5)
Air: low priority (5)

SWMU No.: #18

Unit Name: Chlor-Alkali Waste Storage Pad

Unit

Description: This unit was located in the southeastern portion of the main manufacturing plant, Department 731. This unit was used as both a waste pile and a container storage area. This unit was of concrete construction, with a 8 inch walls. The dimensions of the unit were 48 feet by 51 feet. Concrete walls surrounded the perimeter of the pavement on three sides. In 1984 the height of the dike wall was raised by four feet to a total of 7 feet to address wastes blowing out of the unit. The unit had a RCRA Part A permitted capacity of 40 cubic yards. Wastes were managed as a pile, in roll-off boxes, drums, or bulk bags. The pavement of the unit was sloped to allow leachate to flow to a drain connected with the Chlor-Alkali wastewater treatment plant (SWMU #4). A groundwater monitoring system consisting of four wells (three downgradient and one upgradient well) were installed to assess groundwater quality for the purposes of RCRA closure of this unit. Monitoring information indicates that groundwater flow direction is primarily to the west.

Date of Start Up: Waste management activities were conducted in this area as early as 1974. The concrete pad was constructed in 1981.

Date of Closure: The Agency approved a closure plan for this unit in 1988. As of the date of this report, the Agency has not approved closure certification for this unit.

Wastes Managed: The wastes managed by this unit were (1) sulfide sludges, (2) off-specification gyp, (3) mercury contaminated carbon, and (4) mercury contaminated equipment.

Release Controls: The unit had concrete diking, and a leachate collection system which drained to the Chlor-Alkali wastewater treatment unit (SWMU #4).

History of
Releases:

Agency files indicate that Monsanto raised the height of the dike walls by three feet to address releases of waste due to wind dispersion. Soil sampling and analysis conducted for the purposes of RCRA closure indicated that soils had been contaminated with mercury. Groundwater monitoring results indicate that groundwater underlying this unit is contaminated by the following compounds: benzene, chlorobenzene, methylene chloride, aniline, 2-chlorophenol, 2-nitrophenol, m- and p-creosols, 1,2-dichlorobenzene, , 1,3-dichlorobenzene, 1,4-dichlorobenzene, nitrobenzene, 4-trichlorobenzene, 2,4,6-trichlorophenol, o-nitroaniline, Dieldrin, Arochlor 1242, arsenic, and selenium.

Conclusions:

Soil: low priority (5)
Groundwater: medium priority (4)
Air: low priority (3)

SWMU No.: #19

Unit Name: Facility Landfill

Unit Description: This unit is located in the northwestern portion of the main manufacturing plant, bordered on the north by Monsanto Avenue, and on the west by Route 3. This unit was identified on the RCRA Part A application as a closed facility landfill. The approximate dimensions of this unit are 300 feet by 750 feet. This area is currently covered by a gravel surface. Monsanto representatives state that this area may not have been used as a landfill. This area was formerly used as a contractors parking lot. The closest monitoring wells are located approximately 300 - 400 feet from the southwest corner of the landfill.

Date of Start Up: The date of initiation of operations of this unit is not specified.

Date of Closure: The date which Monsanto closed this unit is not specified.

Wastes Managed: The wastes managed by this unit have not been specified.

Release Controls: Construction of the unit is unknown; therefore, information pertaining to release controls is also unknown;

History of Releases: There is no information available regarding releases from this unit.

Conclusions: Soil: high priority (1)
Groundwater: high priority (1)
Air: low priority (3)

SWMU No.: #20

Unit Name: Facility Landfill

Unit Description: This unit is located in the central portion of the main manufacturing area. The facility RCRA Part A application identified the location of this unit. The dimensions of this unit are 150 feet by 350 feet. Since this unit is located in the central portion of the plant, it is likely that this unit is covered with process equipment.

Date of Start Up: The date of initiation of operations at this unit has not been specified.

Date of Closure: The date Monsanto ceased operations of this unit has not been specified.

Wastes Managed: The wastes managed by this unit have not been specified.

Release Controls: Construction of the unit is unknown; therefore, information pertaining to release controls is also unknown;

History of Releases: There is no information available regarding releases from this unit.

Conclusions: Soil: high priority (1)
Groundwater: high priority (1)
Air: low priority (3)

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SWMU No.: #22

Unit Name: Riverfront Landfill

Unit

Description: This unit is located approximately 3500 feet to the west of the main manufacturing plant. This property is also referred to as "Lot H", and the "Sauget Toxic Dump". It appears that two different "cells" were developed over the period of operations. Monsanto states that waste management operations ceased at this site in 1978. A two foot concrete cap is constructed over the unit. Groundwater monitoring wells have been installed in this area to determine the impact of operations on groundwater quality.

NOTE: As noted on page 4 of this of this RFA, since this SWMU is located on Lot H property, future Corrective Actions for this unit may not be required by the Agency.

Date of
Start Up:

Monsanto states that initiation of operations of this unit began in the 1950s.

Date of Closure: Monsanto states that operations at this site ceased in 1978.

Wastes Managed: All wastes managed by this unit have not been identified. It is believed that wastes containing dioxins, solvents, organic and inorganic chemicals, pesticides and metals were landfilled at this site.

Release
Controls:

Construction of the unit is unknown; therefore, information pertaining to release controls is also unknown;

History of
Releases:

Groundwater monitoring information available for this site indicate that the groundwater quality has been contaminated by numerous organic and inorganic compounds.

Conclusions:

Soil: high priority (1)
Groundwater: high priority (1)
Air: low priority (3)

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SWMU No.: #23

Unit Name: Department 247 Tank Storage

Unit Description: This unit was located in Department 247, identified as Item 271. This unit is of metal construction with a 2,000 gallons capacity. The pavement in the area of this unit was noted to be concrete or asphalt. A tank assessment conducted on this unit indicated a deficient wall thickness. Wastes from this unit were transferred to SWMU #18.

Date of Start Up: The date which operations were initiated for this unit was not specified.

Date of Closure: The Agency approved closure certification for this unit on June 14, 1989.

Wastes Managed: *The wastes managed by this unit were liquid wastes which included the compounds methyl ethyl ketone and methyl isobutyl ketone.*

Release Controls: Construction of the unit is unknown; therefore, information pertaining to release controls is also unknown;

History of Releases: There is no information available regarding releases from this unit.

Conclusions: Soil: low priority (5)
Groundwater: low priority (5)
Air: low priority (5)

SWMU No.: #24

Unit Name: Facility Landfill

Unit Description: This unit is located to the southwest of Building BBZ. This land disposal unit was identified on a 1942 facility map as the "Department 221 Toxic Dump". The dimensions of this unit are approximately 150 feet by 175 feet. This area is currently underlying pavement and process units.

Date of Start Up: The date of initiation of operation of this unit was not specified.

Date of Closure: Monsanto representatives state that this unit was "closed" and filled-in before 1942.

Wastes Managed: This unit was primarily used as a disposal site for nitrochlorobenzene wastes. Drums recovered from this area contained 2-nitrobiphenyl and 4-nitrobiphenyl compounds.

Release Controls: Construction of the unit is unknown; therefore, information pertaining to release controls is also unknown;

History of Releases: There is no information available regarding releases from this unit.

Conclusions: Soil: high priority (1)
Groundwater: high priority (1)
Air: low priority (3)

SWMU No.: #25

Unit Name: Facility Landfill

Unit Description: This unit is located to the south of Building BBK in the southwestern portion of the main manufacturing plant. This land disposal unit was identified on a 1942 facility map as the "New Toxic Dump". The dimensions of the unit are approximately 75 feet by 100 feet. This unit is currently covered by pavement and process units.

Date of Start Up: Monsanto stated that operation of this unit occurred from approximately 1942 through 1951.

Date of Closure: As noted above, operations of this unit were ceased in 1951.

Wastes Managed: The wastes managed by this unit have not been specified.

Release Controls: Construction of the unit is unknown; therefore, information pertaining to release controls is also unknown;

History of Releases: There is no information available regarding releases from this unit.

Conclusions: Soil: high priority (1)
Groundwater: high priority (1)
Air: low priority (3)

SWMU No.: #26

Unit Name: Facility Landfill

Unit Description: This unit is located in the southwestern portion of the main manufacturing area. This unit is also referred to as the "Phenol Residue Dump". This area is currently under a tank farm and Building BBA, north of SWMUs #26 and 27. The dimensions of this unit are approximately 75 feet by 100 feet.

Date of Start Up: The date of initiation of operations at this unit was not specified.

Date of Closure: Monsanto representatives state that the unit may have been closed as early as 1951.

Wastes Managed: This unit primarily managed wastes from the now defunct Phenol Department.

Release Controls: Construction of the unit is unknown; therefore, information pertaining to release controls is also unknown;

History of Releases: There is no information available regarding releases from this unit.

Conclusions: Soil: high priority (1)
Groundwater: high priority (1)
Air: low priority (3)

SWMU No.: #27

Unit Name: Route 3 Drum Site

Unit Description: This unit is located in the southwestern corner of the Monsanto property identified as Lot F. The approximate dimensions of this unit are 5 feet by 250 feet, with an 18 foot depth. Excavations conducted in this area indicate that landfilling of containers and bulk landfilling of solids and liquids may have occurred. Monsanto has constructed a cap, consisting of clay and geotextile materials, over the area. Groundwater monitoring wells have been installed in the vicinity of the unit to assess impact on groundwater quality due to operation of this unit.

Date of Start Up: The date of initiation of operation of this unit was not specified. This unit was in operation before 1955.

Date of Closure: The date at which operations ceased at this unit was not specified. Monsanto constructed the cap for the unit in the early 1980s.

Wastes Managed: Sampling of the contents of drums uncovered during excavation activities indicates the presence of nitrochlorobenzene, orthochlorobenzene, dinitrochlorobenzene, 2-nitrophenol, and 4-nitrophenol.

Release Controls: Monsanto constructed a cap for this unit in the early 1980s.

History of Releases: Visual inspection of the drums during excavation activities indicated that the containers had ruptured causing contamination of the soils. Groundwater monitoring wells in the area indicate that the groundwater underlying the unit have been impacted.

Conclusions: Soil: high priority (1)
Groundwater: high priority (1)
Air: low priority (3)

SWMU No.: #28

Unit Name: Facility Landfill

Unit Description: This unit is located in the southwestern portion of the main manufacturing plant, north of Building BBU. During excavation activities conducted in this area, two abandoned tanks containing hazardous constituents were unearthed. The location of this unit is currently paved.

Date of Start Up: The date of initiation of operations at unit were not specified.

Date of Closure: The date Monsanto ceased operation of this unit was not specified.

Wastes Managed: Sampling and analysis conducted on the tanks detected the compounds othrochlorophenol, parachlorophenol, 2,4-dichlorophenol, trichlorophenol, tetrachlorophenol, and pentachlorophenol.

Release Controls: Construction of the unit is unknown; therefore, information pertaining to release controls is also unknown;

History of Releases: There is no information available regarding releases from this unit.

Conclusions: Soil: high priority (1)
Groundwater: high priority (1)
Air: low priority (3)

SWMU No.: #29

Unit Name: Surface Impoundment

Unit Description: This unit is located in the western portion of the main manufacturing area. This unit is also referred to in a 1942 facility map as was the "Old Discharge Pond". The approximate dimensions of this unit are 125 feet by 125 feet. A bermed tank unit is now located in this area.

Date of Start Up: The date of initiation of operations of this unit was not specified.

Date of Closure: The date Monsanto ceased operations at this unit was not specified. Aerial photographs and Agency file information indicate that this unit was in operation at least from the years 1942 through 1951.

Wastes Managed: The wastes managed by this unit were not specified.

Release Controls: Construction of the unit is unknown; therefore, information pertaining to release controls is also unknown;

History of Releases: There is no information available regarding releases from this unit.

Conclusions: Soil: high priority (1)
Groundwater: high priority (1)
Air: low priority (3)

SWMU No.: #30

Unit Name: Surface Impoundment

Unit Description: This unit was located on the southwestern portion of the main manufacturing facility. This unit was referred to in a 1942 facility map as the "Pond (filled in)". The dimensions of this unit were approximately 300 feet by 75 feet. The area is currently covered with gravel.

Date of Start Up: The date which operations at this unit were initiated was not specified.

Date of Closure: Available information suggests that this unit operated at least through the years 1942 to 1951.

Wastes Managed: The wastes managed by this unit were identified as sodium sulfate wastes.

Release Controls: Construction of the unit is unknown; therefore, information pertaining to release controls is also unknown;

History of Releases: There is no information available regarding releases from this unit.

Conclusions: Soil: high priority (1)
Groundwater: high priority (1)
Air: low priority (3)

SWMU No.: #31

Unit Name: Surface Impoundment

Unit Description: This unit is located on the western side of the main manufacturing plant, immediately south of SWMU #32. This unit is identified in a 1942 facility map as the "Old Pond". The approximate dimensions of this unit were 375 feet by 75 feet. This area is currently covered by Building BBZ.

Date of Start Up: The date of initiation of operations of this unit were not specified.

Date of Closure: Available information indicates that this unit was "closed" and filled-in by the year 1942.

Wastes Managed: The wastes managed by this unit were not specified.

Release Controls: Construction of the unit is unknown; therefore, information pertaining to release controls is also unknown;

History of Releases: There is no information available regarding releases from this unit.

Conclusions: Soil: high priority (1)
Groundwater: high priority (1)
Air: low priority (3)

SWMU No.: #32

Unit Name: Incinerator

Unit
Description: This unit was located in the mid-western portion of the main manufacturing plant, south of Building BBG. Approximately 151,000 tons of organic wastes were incinerated at this unit during operations. This area is currently paved with gravel.

Date of
Start Up: This unit initiated operations in 1971.

Date of Closure: This unit ceased operations in 1977.

Wastes Managed: Wastes managed by this unit include chemical intermediates, halogenated aromatics, PCBs, plasticizers, polar solvents, and halogenated aromatic solvents.

Release
Controls: Construction of the unit is unknown; therefore, information pertaining to release controls is also unknown;

History of
Releases: There is no information available regarding releases from this unit.

Conclusions: Soil: medium priority (2)
Groundwater: low priority (1)
Air: low priority (3)

SWMU No.: #33

Unit Name: Department 222 Storage Tank

Unit
Description: This unit is located in Department 222, and is identified as Item 612. This unit is of carbon steel construction, with a 4700 gallon capacity. The dimensions of this unit were 9 feet OD by 9.5 feet. Wastes were fed into this tank for separation of water and ammonia. Tank effluent is sent to carbon treatment.

Date of
Start Up: The date at which operations initiated were not specified.

Date of Closure: This unit is currently in operation.

Wastes Managed: The wastes managed by this unit are identified as paranitrochlorobenzene, paranitroniline, and nitrochlorobenzenes.

Release
Controls: It does not appear that secondary containment was present at this unit.

History of
Releases: There is no information available regarding releases from this unit.

Conclusions: Soil: medium priority (2)
Groundwater: low priority (1)
Air: low priority (3)

SWMU No.: #34

Unit Name: Department 237 Storage Tank

Unit Description: This unit was located in Department 237, and identified as Item 210. This unit was also referred to as a ketone residue tank.

Date of Start Up: The date of initiation of operations of this unit were not specified.

Date of Closure: This unit was dismantled in 1983.

Wastes Managed: This unit managed wastes identified as dibenzyl p-chlorophenol, p-chlorophenol, o-chlorophenol, phenol, o-benzyl-p-chlorophenol, isopropyl alcohol, and other "high boilers".

Release Controls: Construction of the unit is unknown; therefore, information pertaining to release controls is also unknown;

History of Releases: There is no information available regarding releases from this unit.

Conclusions: Soil: medium priority (2)
Groundwater: low priority (1)
Air: low priority (3)

SWMU No.: #35

Unit Name: PCB Warehouse

Unit
Description: This unit was located in the central portion of the main manufacturing plant, south of Building BBT. Wastes were stored in containers. This area is currently covered with asphalt. This unit was dismantled when operations ceased in 1982.

Date of
Start Up: This unit initiated operations in 1979.

Date of Closure: The last shipment of wastes to this unit was in November of 1981. This unit ceased operations in 1982.

Wastes Managed: This unit managed PCB wastes.

Release
Controls: Construction of the unit is unknown; therefore, information pertaining to release controls is also unknown;

History of
Releases: There is no information available regarding releases from this unit.

Conclusions: Soil: medium priority (2)
Groundwater: low priority (1)
Air: low priority (3)

SWMU No.: #36

Unit Name: Waste Detoxification Unit

Unit Description: This unit was located in the Chlor-Alkali Wastewater Treatment Unit (SWMU #4), located in the southeastern corner of the main manufacturing area. This unit was included on the facility's RCRA Part A application, and was identified as Item 405. The construction of this unit was not specified. The area is currently a gravel covered with no structures or buildings apparent. Groundwater monitoring wells have been installed in this area for the purpose of RCRA closure of the Chlor-Alkali waste pile.

Date of Start Up: Assumed to be the same as the start-up date of the Chlor-Alkali wastewater treatment unit. The date of start-up of this unit was not specified.

Date of Closure: Assumed to be the same as the date of dismantling of the Chlor-Alkali wastewater treatment plant. The date of closure was not specified.

Wastes Managed: The wastes managed by this unit were liquid phenolic wastes. No EPA Hazardous Waste Code number was specified.

Release Controls: Construction of the unit is unknown; therefore, information pertaining to release controls is also unknown;

History of Releases: There is no information available regarding releases from this unit.

Conclusions: Soil: medium priority (2)
Groundwater: low priority (1)
Air: low priority (3)

SWMU No.: #37

Unit Name: High Boiler Purge Tank

Unit
Description: This tank unit is located in the plant's Nitrochlorobenzene manufacturing operations, identified as Department 221. The tank is of carbon steel construction, with a total capacity of 6,000 gallons. Secondary containment is provided for this unit by a dike. The secondary containment integrity appears in good condition; however, the concrete pavement of the system looks to be of new construction (within the last 2 years).

Date of
Start Up:

Date of Closure: Monsanto is currently pursuing RCRA Part B permitted status for this unit.

Wastes Managed: This unit manages wastes which are characteristically hazardous due to chlorobenzene concentrations.

Release
Controls: This unit has secondary containment in the form of concrete diking surrounding the tank unit.

History of
Releases: There is no information available regarding releases from this unit.

Conclusions: Soil: medium priority (2)
Groundwater: low priority (1)
Air: medium priority (3)

SWMU No.: #38

Unit Name: Spent Carbon Tank

Unit
Description: This unit is located in Department 233. Construction of this unit is carbon steel with rubber lining, and has total capacity of 5,800 gallons. This tank is placed on a concrete foundation. The unit is used to collect carbon from the Monochlorobenzene Department. This tank does not have secondary containment. Waste carbon is rinsed with water, with waste water being discharged to the departments pre-treatment system. The waste carbon is shipped to Envirotrol for disposal.

Date of
Start-Up:

Date of Closure: Monsanto is currently pursuing RCRA Part B permitted status for this unit.

Wastes Managed: This unit manages wastes which are characteristically hazardous due to benzene content.

Release
Controls: This unit does not have secondary containment.

History of
Releases: There is no information available regarding releases from this unit.

Conclusions: Soil: medium priority (2)
Groundwater: low priority (1)
Air: medium priority (3)

SWMU No.: #39

Unit Name: Department 233 Drum Accumulation Area

Unit Description: This is an outdoor drum accumulation area located in the vicinity of Department 233. This unit's dimensions are approximately 40 feet by 10 feet. The pavement of the area is asphalt, which is sloped towards a storm drain located approximately 10 feet away. This unit does not have secondary containment.

Date of Start Up: The date of initiation of operations of this unit was not specified.

Date of Closure: This unit was active on the date of the VSI.

Wastes Managed: Monsanto representatives stated that this container storage area managed wastes which included PCBs and re-worked Monochlorobenzene.

Release Controls: Releases from this unit would be contained by the facility storm sewer.

History of Releases: There is no information available regarding releases from this unit.

Conclusions: Soil: medium priority (2)
Groundwater: low priority (1)
Air: low priority (3)

SWMU No.: #40

Unit Name: Drum Storage Area

Unit Description: This unit was located in the southwestern portion of the main manufacturing plant, to the north of the large benzene storage tank identified as "Big Mo". This unit was identified on the facility's RCRA Part A application, and is identified as the "Old West Drum Storage Area". Wastes were managed in containers at this unit.

Date of Start Up: The date of initiation of operations of this unit was not specified. This unit was identified in the 1980 RCRA Part A application for this facility.

Date of Closure: The date Monsanto ceased operations of this unit was not specified.

Wastes Managed: The wastes managed by this unit were not

Release Controls: Construction of the unit is unknown; therefore, information pertaining to release controls is also unknown;

History of Releases: There is no information available regarding releases from this unit.

Conclusions: Soil: medium priority (2)
Groundwater: low priority (1)
Air: low priority (3)

SWMU No.: #41

Unit Name: Facility Landfill

Unit
Description: The location and characteristics of this unit were not specified. This unit was detected during excavation activities in the early 1980s. Thirty drums and contaminated soils were present.

Date of
Start Up: The date initiation of operations of this unit was not specified.

Date of Closure: The date which Monsanto ceased operations of this unit was not specified.

Wastes Managed: Wastes managed at this unit were not specified.

Release
Controls: Construction of the unit is unknown; therefore, information pertaining to release controls is also unknown;

History of
Releases: Contaminated soil were identified as being present upon excavation of the drums.

Conclusions: Soil: high priority (1)
Groundwater: high priority (1)
Air: low priority (3)

SWMU No.: #42

Unit Name: Container Accumulation Area

Unit Description: This outdoor unit is located in the facility's Chlorobenzene Department. Pavement is constructed of concrete. No secondary containment was present. Releases from the unit would flow to the facility sewer system.

Date of Start Up: The date of initiation of operations of this unit was not specified.

Date of Closure: This unit was active at the time of the VSI.

Wastes Managed: The wastes managed by this unit were not specified; wastes are assumed to be chlorobenzene process wastes.

Release Controls: This unit does not have secondary containments. Releases from this unit would be contained by the facility sewer system.

History of Releases: There is no information available regarding releases from this unit.

Conclusions: Soil: medium priority (2)
Groundwater: low priority (1)
Air: low priority (3)

SWMU No.: #43

Unit Name: Department 277 Drainage Trenches

Unit Description: These units are located in the Santoflex manufacturing department. These units provide in-ground drainage for process wastewaters. These units are of continuous concrete construction, and lead to a sump where the wastewaters are separated to remove the organic constituents. These units are grated. The wastewaters drain over asphalt and concrete pavement to reach the drainage trenches.

Date of Start Up: The date of initiation of operations of these units was not specified.

Date of Closure: This unit was active at the time of the VSI.

Wastes Managed: The wastewaters main components are methyl isobutyl ketone and methyl ethyl ketone.

Release Controls: Construction of the unit is unknown; therefore, information pertaining to release controls is also unknown;

History of Releases: There is no information available regarding releases from this unit.

Conclusions: Soil: medium priority (2)
Groundwater: low priority (1)
Air: medium priority (3)

SWMU No.: #44

Unit Name: Department 243 Container Storage Area

Unit Description: This outdoor unit is located in the Phosphorus Trichloride Department, identified as Department 243. The unit pavement is constructed of asphalt and concrete, with no visible secondary containment structures present. Releases from the unit would be contained in the facility sewer system.

Date of Start Up: The date of initiation of operation of this unit was not specified.

Date of Closure: The date Monsanto ceased operation of this unit was not specified.

Wastes Managed: The wastes managed by this unit were not specified; assumed to be wastes from the Phosphorus Trichloride operations.

Release Controls: No secondary containment was present at the unit. Unit drainage would be contained by the facility sewer system.

History of Releases: There is no information available regarding releases from this unit.

Conclusions: Soil: medium priority (2)
Groundwater: low priority (1)
Air: low priority (3)

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SWMU No.: #45

Unit Name: Facility Landfill

Unit
Description: This unit is located in the northwestern portion of the facility, on Monsanto property identified as Lot D. This property is bordered on the north by Monsanto Avenue, on the south by the main Monsanto manufacturing facility, and on the west by Route 3. Operations of this unit appear to have been conducted from approximately 1950 through 1955 - 1957. This site was identified in a CERCLA 103(c) form as an uncontrolled site. This site was closed as a landfill and was used as a parking lot. This area is now a gravel covered area used for miscellaneous equipment storage.

Date of
Start Up: This unit began operations in 1950.

Date of Closure: This unit closed operations in the time period of 1955 - 1957.

Wastes Managed: The wastes managed by this unit were not specified.

Release
Controls: Construction of the unit is unknown; therefore, information pertaining to release controls is also unknown.

History of
Releases: A citizen complaint of chemicals surfacing in the parking lot was made in 1982. A site inspection did not confirm this complaint.

Conclusions: Soil: high priority (1)
Groundwater: high priority (1)
Air: low priority (3)

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SWMU No.: #46

Unit Name: Facility Landfill

Unit
Description: This unit is located in the northeastern portion of the Monsanto property identified as Lot F. This unit is bounded on the north by Monsanto Avenue, and on the east by Route 3. The dimensions of this unit were not specified. This unit was initially identified on a CERCLA 103(c) form. This unit operated from 1957 through 1978. The area is currently an open field with vegetative growth. Groundwater wells monitored by Monsanto are located on the eastern and western portion of the Lot F property.

Date of
Start Up: This unit began operations in 1957.

Date of Closure: This unit ceased operations in 1978.

Wastes Managed: The wastes managed by this unit were not specified.

Release
Controls: Construction of the unit is unknown; therefore, information pertaining to release controls is also unknown.

History of
Releases: There is no information available regarding releases from this unit.

Conclusions: Soil: high priority (1)
Groundwater: high priority (1)
Air: low priority (3)

SWMU No.: #47

Unit Name: Department 255 Wastewater Pre-treatment

Unit Description: This unit was located in the south-central portion of the main manufacturing facility, north of Building BBO. This outdoor wastewater treatment system consists of two metal tank units in which wastewaters from the 4-Nitrobiphenyl and Paranitroaniline Departments are treated by carbon absorption. Treated wastewaters are discharged to the facility sewer system. These tank units overlies concrete pavement. No secondary containment is present.

Date of Start Up: The date of initiation of operations for this unit was not specified.

Date of Closure: This unit was active at the time of the VSI. The date which Monsanto intends to cease operations of this unit was not specified.

Wastes Managed: The wastes managed by this unit were wastewaters generated from the Paranitroaniline and 4-Nitrobiphenyl Departments.

Release Controls: No secondary containment is present.

History of Releases: There is no information available regarding releases from this unit.

Conclusions: Soil: medium priority (2)
Groundwater: low priority (1)
Air: low priority (1)

SWMU No.: #48

Unit Name: Department 233/221 Wastewater Pre-Treatment

Unit

Description:

This pre-treatment system consists of two distinct units, constructed in 1990. Both components of the system are located in the central portion of the main manufacturing area. The Department 221 system is located northwest of Building BK. This system is used to treat wastewaters from the nitrochlorobenzene department. It consists of two tanks for waste storage, and a stripper. Once the organics have been stripped and condensed, they are sent back to the operations. The wastewaters are discharged to the facility sewer system.

The Department 233 system is located on the northeast corner of Fourth Street and D Street at the facility. The system consists of three sumps. The system handles wastes which are composed of monochlorobenzene, dichlorobenzene and benzene contaminated process waters. Benzene is injected into the wastewaters, which floats to the top of the water, picking up the heavier organics in the process. The organics are stripped off the top. Wastewaters are then steam-stripped to remove any residual organics. Organics are sent back to operations. Wastewaters from the steam stripping are discharged to the facility sewer system.

These units are constructed of concrete, and have secondary containment present in the form of curbing. The pavement located outside the containment area is asphalt. These systems are permitted under Agency DWPC permit number 1900-EN-0928. The design flow of the system is 338,000 gallons per day from the Department 221 unit, and 115,200 gallons per day from the Department 233 unit.

Date of
Start Up:

This unit was constructed in 1990.

Date of Closure:

This unit was active at the time of the VSI. The date at which Monsanto will cease operation of the units has not been specified.

Wastes Managed: The wastes managed by this unit are
wastewaters from the Monochlorobenzene
(Department 221) and Nitrochlorobenzene
(Department 233) operations.

Release
Controls: These units have secondary containment in
the form of curbing.

History of
Releases: The Department 233 unit has had equipment
failures which have caused releases. All
releases have been contained by the
curbing.

Conclusions: Soil: medium priority (2)
Groundwater: low priority (1)
Air: medium priority (3)

SWMU No.: #49

Unit Name: Department 219/221 Pre-Treatment

Unit Description: These indoor units are located in the southeastern portion of the main manufacturing plant. This unit was constructed in October of 1990. The treatment unit consists of four carbon towers used to treat process wastewaters from the Paranitroaniline and 4-Nitrodiphenyl departments. The system towers overlie concrete pavement. Wastewaters are piped to the system, where they are initially treated for pH. The wastewaters are then passed through the carbon towers twice in order to remove organics. Carbon for one unit is spent on the average of 30-48 hours. This unit was permitted for construction by the Agency's DWPC by permit number 1990-EN-0927. The permitted maximum design flow is 140,000 gallons per day.

Date of Start Up: This unit was constructed in October of 1990.

Date of Closure: This unit was active at the time of the VSI. The date at which Monsanto intends to cease operations of this unit was not specified.

Wastes Managed: This unit manages process wastewaters from the Paranitroaniline and 4-Nitrodiphenyl Departments.

Release Controls: Any release from the unit flows to a sump unit located in the north end of the building. Wastewaters contained in the sump are pumped back into the treatment process.

History of Releases: There is no information available regarding releases from this unit.

Conclusions: Soil: medium priority (2)
Groundwater: low priority (1)
Air: low priority (3)

SWMU No.: #50

Unit Name: Sulfate Pile

Unit
Description: This unit was located in the south-central portion of the main manufacturing facility, east of Department 227. This unit was identified on a 1942 facility map, and is believed to be any unlined waste management unit. The approximate dimensions of the unit were 50 feet by 100 feet. The area of the former unit is currently paved with gravel.

Date of
Start Up: The date of initiation of operations of this unit was not specified. This unit was initially identified on a 1942 facility map.

Date of Closure: The date which Monsanto ceased operations for this unit was not specified.

Wastes Managed: The wastes managed by this unit were
wastes. believed to be solid sulfate process

Release
Controls: Construction of the unit is unknown; therefore, information pertaining to release controls is also unknown.

History of
Releases: There is no information available regarding releases from this unit.

Conclusions: Soil: high priority (1)
Groundwater: high priority (1)
Air: low priority (3)

SWMU No.: #51

Unit Name: Borrow Pit

Unit Description: This suspected land disposal unit was located in southwestern portion of the main manufacturing area, south of the ACL cooling tower. The approximate dimensions of this unit were 130 feet by 180 feet. This unit was initially identified on a 1942 facility map. This area is currently located under the concrete base of the ACL cooling tower.

Date of Start Up: The date of initiation of operations of the unit was not specified; this unit was initially identified on a 1942 facility map.

Date of Closure: The date which Monsanto ceased operations of this unit was not specified.

Wastes Managed: The wastes managed by this unit were not specified.

Release Controls: Construction of the unit is unknown; therefore, information pertaining to release controls is also unknown.

History of Releases: There is no information available regarding releases from this unit.

Conclusions: Soil: high priority (1)
Groundwater: high priority (1)
Air: low priority (3)

SWMU No.: #52

Unit Name: Spray Pond

Unit
Description: This surface impoundment unit is located in the southeastern portion of the main manufacturing facility. This unit was initially identified on a 1942 facility map.

Date of
Start Up: This unit was initially identified on a 1942 facility map.

Date of Closure: The date which Monsanto ceased operations of this unit was not specified.

Wastes Managed: The wastes managed by this unit were not specified.

Release
Controls: Construction of the unit is unknown; therefore, information pertaining to release controls is also unknown.

History of
Releases: There is no information available regarding releases from this unit.

Conclusions: Soil: high priority (1)
Groundwater: high priority (1)
Air: low priority (3)

SWMU No.: #53

Unit Name: South Lot Drum Site

Unit
Description: This suspected land disposal unit is located in the southwestern portion of the main manufacturing facility, southwest of the ACL cooling tower. This unit was identified in a November 1991 Monsanto submittal. This area is currently covered with concrete and gravel.

Date of
Start Up: The date of initiation of operations of this unit was not specified.

Date of Closure: The date which Monsanto ceased operations at this site was not specified.

Wastes Managed: The wastes managed at this unit were not specified.

Release
Controls: Construction of the unit is unknown; therefore, information pertaining to release controls is also unknown.

History of
Releases: There is no information available regarding releases from this unit.

Conclusions: Soil: high priority (1)
Groundwater: high priority (1)
Air: low priority (3)

SWMU No.: #54

Unit Name: PCB Substation Transformer Area

Unit
Description: This unit is located in the central portion of the main manufacturing plant, at the corner of 3rd and Falling Springs Road. The unit consists of a 2 watt to 2400 volt transformer in which PCBs are utilized for heat resistance. The unit lies on a concrete based with secondary containment present in the form of a dike. The concrete in the area was stained and deteriorating in spots.

Date of
Start Up: The date of initiation of operations of this unit was not specified.

Date of Closure: This unit was active at the time of the VSI.

Wastes Managed: The wastes managed by this unit were PCBs.

Release
Controls: This unit had secondary containment present in the form of diking.

History of
Releases: The pavement in the area of the unit appeared to be stained due to operations of the unit.

Conclusions: Soil: medium priority (2)
Groundwater: low priority (1)
Air: low priority (3)

SWMU No.: #55

Unit Name: Truck and Railcar Unloading Area

Unit
Description: This outdoor unit is located in the west-central portion of the main manufacturing area, along G Street. Rail and truck tankers were loaded with product in this area for off-site shipment. Loading equipment included a pump unit and associated piping. This area consists of a concrete and gravel base, with the base and the equipment coated with residues from loading operations. A sewer drain was located in the area, and the grate was also covered with residues from loading operations. Drums were also noted to be in the area.

Date of
Start Up: The date of initiation of operations of this unit were not specified.

Date of Closure: This unit was active at the time of the VSI. The date which Monsanto intends to cease operations of this unit was not specified.

Wastes Managed: Wastes managed through routine and systematic releases were not specified.

Release
Controls: Some equipment, such as the pump unit, had secondary containment in the form of diking. Containers present at this location did not have secondary containment provided. Residues from loading operations appeared to have exceeded the secondary containment devices.

History of
Releases: Process equipment and pavement were coated with residues from operations.

Conclusions: Soil: high priority (4)
Groundwater: low priority (2)
Air: medium priority (3)

SWMU No.: #56

Unit Name: Spent Carbon Tote Box Area

Unit Description: This unit is located near Substation 4 in the central portion of the main manufacturing area. The spent carbon containers are of steel construction with a 6000 pound capacity. Pavement in the storage area consists of asphalt, and is dimensioned approximately 50 feet by 50 feet. This unit is permitted for construction by the Agency's DAPC. Operations have been conducted in this area for approximately 1 year. The spent carbon is shipped to Envirotrol in Pennsylvania for treatment.

Date of Start Up: This unit has been in operation approximately 1 year.

Date of Closure: This unit was active at the time of the VSI. The date which Monsanto intends to cease operations of this unit was not specified.

Wastes Managed: The wastes managed by this unit are benzene contaminated wastes from facility operations.

Release Controls: This unit did not appear to have secondary containment present.

History of Releases: There is no information available regarding releases from this unit.

Conclusions: Soil: medium priority (2)
Groundwater: low priority (1)
Air: medium priority (3)

SWMU No.: #57

Unit Name: BBZ Warehouse

Unit Description: This outdoor waste discharge area is located on the northern half of the west side of Building BBZ in Department 240. Building BBZ is located in the southwestern portion of the main manufacturing area. Wastes from the Nitrochlorobenzene process are discharged from a pipe located on the outside of the building. The outfall area is gravel paved, adjacent to railroad tracks and facility road H. The pavement, building, and asphalt in the area was stained by the discharge residues.

Date of Start Up: The date of initiation of operation of this unit was not specified.

Date of Closure: This unit was active at the time of the VSI. The date which Monsanto intends to cease operations of this unit was not specified.

Wastes Managed: The wastes managed at this unit are liquid wastes from the Santoflex processing area.

Release Controls: No release controls were present in this area.

History of Releases: Residues from the release of these wastes were present on the building, gravel and pavement surrounding the outfall.

Conclusions: Soil: high priority (4)
Groundwater: low priority (2)
Air: medium priority (3)

SWMU No.: #58

Unit Name: BBQ Warehouse

Unit
Description: This unit was located on the southwest portion of the main manufacturing plant, on the west side of Building BBQ. This unit consisted of a discharge outfall to the pavement outside of Building BBQ. Wastes discharged are believed to be from the Santoflex process. The outfall was located over a gravel area, with asphalt pavement located nearby. Staining by waste residues was apparent on the gravel area and on the BBQ building.

Date of
Start Up: The date of initiation of operations of this unit was not specified.

Date of Closure: This unit was active at the time of the VSI. The date which Monsanto intends to cease operations of this unit was not specified.

Wastes Managed: The wastes managed by this unit are believed to be from the Santoflex process.

Release
Controls: No secondary containment was present in this area.

History of
Releases: The gravel and building located near the outfall was stained by residues from discharge.

Conclusions: Soil: high priority (4)
Groundwater: low priority (2)
Air: medium priority (3)

SWMU No.: #59

Unit Name: Benzene Storage Tank

Unit
Description: This unit is located in the southwestern portion of the main manufacturing plant. The tank is of metal construction, overlying an earthen material. Secondary containment is present in the form of a concrete berm approximately 4 feet in height. This tank unit is used to store benzene for process operations.

Date of
Start Up: The date of operations initiation for this unit was not specified.

Date of Closure: This unit was active at the time of the VSI. The date which Monsanto intends to cease operations of this unit was not specified.

Wastes Managed: The wastes which are of concern for this unit are benzene contaminated wastes due to releases from this unit.

Release
Controls: This unit has secondary containment in the form of a four foot concrete dike. However, the base of the secondary containment system is earthen materials.

History of
Releases: Monsanto representatives requested that this unit be included as a SWMU due to releases to the environment from this unit.

Conclusions: Soil: high priority (4)
Groundwater: medium priority (4)
Air: high priority (3)

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SWMU No.: #60

Unit Name: BBU Waste Pile Area

Unit

Description: This unit was located in the southwestern portion of the main manufacturing plant, south of Building BBU. Wastes from facility excavation activities, contaminated with heavy metals, was stockpiled in this area. Monsanto representatives indicated that these wastes were non-hazardous. The wastes were eventually disposed of off-site. The area is currently paved with gravel. No secondary containment devices appear to be present.

Date of Start Up: The date of initiation of operations of this unit was not specified.

Date of Closure: The date which Monsanto ceased operations of this unit was not specified.

Wastes Managed: The wastes managed at this unit were contaminated with heavy metals. Monsanto representatives stated that these materials were non-hazardous.

Release Controls: Construction of the unit is unknown; therefore, information pertaining to release controls is also unknown.

History of Releases: There is no information available regarding releases from this unit.

Conclusions: Soils: high priority (1)
Groundwater: low priority (1)
Air: low priority (3)

SWMU No.: #61

Unit Name: Suspected Sanitary Landfill

Unit
Description: This unit is located in the southwestern portion of the main manufacturing area, south of Building BBU. Monsanto representatives indicated that this may be the location of a former facility sanitary landfill. Excavation activities in the area have uncovered waste materials in the form of construction debris. This area is currently paved with gravel.

Date of
Start Up: The date of initiation of operations of this unit was not specified.

Date of Closure: The date which Monsanto ceased operations of this unit was not specified.

Wastes Managed: The wastes managed by this unit were not specified.

Release
Controls: Construction of the unit is unknown; therefore, information pertaining to release controls is also unknown.

History of
Releases: There is no information available regarding releases from this unit.

Conclusions: Soil: high priority (1)
Groundwater: high priority (1)
Air: low priority (3)

SWMU No.: #62

Unit Name: BI Lot

Unit

Description: This unit is located in the southwestern portion of the main manufacturing facility. This unit is also referenced as the "Boneyard", and the "South Storage Lot". This unit is used as an all purpose storage location for equipment from dismantled process equipment, drum storage, etc. Pavement in the area is of concrete and gravel construction. A chain link fence surrounds the area. The dimensions of the unit is approximately 200 feet by 100 feet. A second area located to the west of the subject unit is used for similar purposes. Waste therminol and oil are stored on a tri-level steel frame rack in the center of the site. Approximately 60 drums were present. No secondary containment was evident. Some waste oil leakage was present underlying the drum storage area.

Date of Start Up: The date of initiation of operations of this unit was not specified.

Date of Closure: This unit was active at the time of the VSI. The date which Monsanto intends to cease operation of this unit was not specified.

Wastes Managed: The wastes managed by this unit are dismantled process equipment, therminol and oil storage in drums, and miscellaneous storage.

Release Controls: No secondary containment was present in this area.

History of Releases: Releases from the therminol and oil drums was apparent at the time of the VSI.

Conclusions: Soil: medium priority (2)
Groundwater: low priority (1)
Air: low priority (3)

SWMU No.: #63

Unit Name: Department 245 Tote Bin Wash Rack

Unit

Description: This unit is located in the south-central portion of the main manufacturing plant. This outdoor unit is situated to the west of Building BBJ. This unit consists of a steam cleaning unit used to scrub P₂ S₅ storage bins. The unit is constructed of metal, with a concrete base. The area has secondary containment in the form of a concrete berm, approximately 6 inches in height. The berm perimeterizes the unit on three sides. Wastewaters from the cleaning are discharged to the facility sewer system by use of a central sewer discharge drain. The unit overlies a concrete base which is sloped to the central discharge drain. Fumes from the bin washing are vented to the atmosphere by a fume stack, approximately 15-20 feet in height.

Date of Start Up: The date of initiation of operations of this unit was not specified.

Date of Closure: This unit was active at the time of the VSI. The date which Monsanto intends to cease operations of this unit was not specified.

Wastes Managed: The wastes managed by this unit were wastewaters generated from cleaning of the phosphorus pentasulfide tote bins.

Release Controls: Secondary containment is present at this unit in the form of a concrete berm, approximately 6 inches in height. This berm is located on three sides of the unit.

History of Releases: There is no information available regarding releases from this unit.

Conclusions: Soil: medium priority (2)
Groundwater: low priority (1)
Air: medium priority (3)

SWMU No.: #64

Unit Name: Tank Car Wash Area

Unit

Description: This unit is located in the southwestern portion of the main manufacturing facility, south of the ACL cooling tower. Truck and railroad tankers are cleaned using a non-chemical, high pressure wash. Wash waters and rinsates are drained from the railcars to a drain which leads to the facility sewer system. Monsanto representatives stated that all types of wastes are carried in these tankers. Wastewater sumps are of concrete construction, with vitrified clay tile leading to the facility sewer system. The area surrounding the wash area are gravel paved.

Date of Start Up: The date of initiation of operation of this unit was not specified.

Date of Closure: This unit was active at the time of the VSI. The date which Monsanto intends to cease operations of this unit was not specified.

Wastes Managed: As referenced above, all types of materials were carried in the tankers.

Release Controls: No secondary containment was present in the tanker wash area.

History of Releases: There is no information available regarding releases from this unit.

Conclusions: Soil: medium priority (2)
Groundwater: low priority (1)
Air: medium priority (3)

SWMU No.: #65

Unit Name: Department 255 Pre-Treatment Sump

Unit Description: This unit is located in the south-central portion of the main manufacturing area, south of Building BBO. This unit consists of a two chambered concrete sump, approximately 15 feet by 30 feet, with a 10 foot depth. This unit is utilized as a separation system for process wastewaters. Wastewaters are pumped into one chamber of the sump, with organics separated on a specific gravity basis. Organics recovered are returned to the process, with wastewaters being discharged to the facility sewer system. This unit is the primary treatment for wastewaters generated by Department 255. SWMU #49 is also utilized for treatment of Department 255 wastewaters. No secondary containment was present in this area.

Date of Start Up: This unit was constructed in November of 1990.

Date of Closure: This unit was active at the time of the VSI. The date which Monsanto intends to cease operations of this unit was not specified.

Wastes Managed: The wastes managed by this unit are process wastewaters which contain xylenes.

Release Controls: No secondary containment was present for this unit.

History of Releases: There is no information available regarding releases from this unit.

Conclusions: Soil: medium priority (2)
Groundwater: low priority (1)
Air: medium priority (3)

SWMU No.: #66

Unit Name: Facility Sewer System

Unit
Description: The extent of this unit is the entire main manufacturing plant (See Figure 11). The facility sewer system is utilized to receive process wastewaters, treated wastewaters, process and waste releases, storm waters, etc. The materials of the sewer system appear to be varied as new portions of the sewer system were constructed to account for expansion of operations over the life of the facility. The facility sewer system discharges to the American Bottoms wastewater physical and chemical treatment plant for primary treatment.

Date of
Start Up: The date of initiation of operations of this system was not specified. The ages of portions of the system vary due to expansion of the initial system.

Date of Closure: This unit was active at the time of the VSI. The date which Monsanto intends to cease operations of this unit was not specified.

Wastes Managed: As stated above, the facility sewer system manages process wastewaters, treated wastewaters, storm waters, etc. The compositions of these wastes vary greatly.

Release
Controls: Construction of the unit is unknown; therefore, information pertaining to release controls is also unknown.

History of
Releases: There is no information available regarding releases from this unit.

Conclusions: Soil: high priority (4)
Groundwater: high priority (4)
Air: low priority (3)

SWMU No.: #67

Unit Name: ACL Wastewater Pre-treatment Unit

Unit

Description: This unit is located in the southwestern portion of the main manufacturing area, south of Building BBK. This unit consists of two 7000 gallon titanium constructed reactor vessels, located in a sealed concrete pit. Construction and operation of these units began in 1983. The activated chlorine department wastewaters are fed into the unit via the department sewer system. Reactions based upon sodium thiosulfate chemistry yield salts and acids, which are discharged to the facility sewer system.

Date of Start Up: Construction and operation of this unit was initiated in 1983.

Date of Closure: This unit was active at the time of the VSI. The date which Monsanto intends to cease operations of the unit was not specified.

Wastes Managed: The wastes managed by this unit are wastewaters from the activated chlorine department, which contain a sodium hypochlorite solution (EPA Hazardous Waste Code D002).

Release Controls: This unit is located in a sealed concrete pit. No other secondary containment devices are present.

History of Releases: A release of excess chlorine from a wastewater resulted in a wastewater permit violation.

Conclusions: Soil: medium priority (2)
Groundwater: low priority (1)
Air: low priority (3)

SWMU No.: #68

Unit Name: Santoflex Wastewater/Oil Pre-treatment Separator

Unit
Description:

This outdoor unit is located in the southwestern portion of the main manufacturing area. This unit consists of a sump and an oil/water separator unit utilized to treat wastewaters from the facility's Santoflex process. The sump is a two chambered unit of concrete construction. This unit receives wastewaters from the Santoflex drainage trenches (SWMU #43), where organics are separated from the wastewaters by specific gravity. Recovered organics are returned to the Santoflex process, and wastewaters are discharged to the facility sewer system. No secondary containment was present in the area.

An oil/water separator was utilized to remove oily substances from the wastewaters before discharge into the facility sewer system. Monsanto ceased operation of this unit approximately 2 to 3 years ago. This unit is of metal construction with a concrete diking approximately 6 inches in height surrounding the unit.

Both units were coated with a black, sticky substance which was noted to be a residue from operations of the units.

Date of
Start Up:

The date of initiation of operations of these units was not specified.

Date of Closure:

The wastewater treatment sump was active at the time of the VSI. The date which Monsanto intends to cease operations of this unit was not specified. Monsanto representatives stated that the oil/water separator had been out of operation for approximately 2 years.

Wastes Managed:

The wastes managed by this unit were process wastewaters from the Santoflex Department, which include the components methyl ethyl ketone and methyl isobutyl ketone.

**Release
Controls:**

No secondary containment was present in the area of the sump. The oil/water separator had secondary containment present in the form of a 6 inch concrete berm.

**History of
Releases:**

The sump and the oil/water separator were coated with residues from the operations of the units.

Conclusions:

Soil: medium priority (2)
Groundwater: low priority (1)
Air: medium priority (3)

SWMU No.: #69

Unit Name: Department 222 Waste Aniline Accumulation Area

Unit Description: This outdoor unit is located in the northeast section of the main manufacturing plant, on the corner of B Street and 2nd Street. This unit consists of container storage of wastes from the ammonia stripping process in Department 222. The drums were of either fiber or plastic construction, and loaded on wooden pallets. The area surrounding the unit was paved with asphalt and concrete. No secondary containment was present.

Date of Start Up: The date of initiation of operations of this unit was not specified.

Date of Closure: This unit was active at the time of the VSI. The date which Monsanto intends to cease operations of this unit was not specified.

Wastes Managed: The wastes managed are waste nitroaniline from Department 222.

Release Controls: No secondary containment is present in the area of this unit.

History of Releases: There is no information available regarding releases from this unit.

Conclusions: Soil: medium priority (2)
Groundwater: low priority (1)
Air: low priority (3)

002407

IV. Visual Site Inspection

A visual site inspection was conducted at the W. G. Krummerich facility in Sauget, Illinois, on August 5 and 6, 1992. Agency representatives included Mike Grant, Gina Search (FOS-Collinsville Office), Amy Dragovich, Jerry Kuhn, Jim Moore, Geordie Smith, Scott Hacke, Eric Minder (DLPC-Permit Section), Paul Takacs, Tim Murphy, Ken Corkill (BOA-RPMS), and Candy Morin (DWPC-Permits). Agency representatives arrived on-site at 10:00 a.m. Monsanto representatives present during the Visual Site Inspection were Mr. Keith Miller (General Superintendent, Governmental and Environmental Affairs), Mr. Bob Hiller (Environmental Engineer), Mr. Rick Hempel, and Ms. Dorothy Washington.

After arrival on-site, IEPA and Monsanto representatives met in a conference room to discuss the objectives of the site inspection. Mr. Miller provided a brief history of the Monsanto facility, a overview of Monsanto's waste reduction history, and Monsanto's corporate commitment to preservation of the environment.

Mr. Dennis Colton of Geraghty and Miller (consultants for Monsanto) provided a summary of the groundwater quality information derived from years of groundwater monitoring and analytical work conducted by Monsanto. In summary, groundwater at the site has been segregated into three units which are not hydrogeologically distinct from each other (i.e., are not separated by a confining unit of low permeability) which have been determined to be contaminated by various parameters. Regional groundwater flow, identified as flowing to the west, has spread a plume of contamination across the boundaries of the Monsanto facility to nearly the eastern border of the Monsanto property identified as Lot H (or the Riverfront Landfill).

At approximately 1:00 p.m., the Agency and Monsanto representatives divided into three groups and began the facility inspection. Each group photographed and filled out a SWMU Characterization Worksheet for each SWMU visited. Copies of the SWMU Characterization Worksheets and photographs of the units are shown as Attachments F and G, respectively. Agency representatives completed the inspection for August 5, 1992 at approximately 4:30 p.m.

On August 6, 1992, Agency representatives arrived on-site at approximately 9:00 a.m. The Agency contingency consisted of Mike Grant, Gina Search (FOS-Collinsville), Amy Dragovich, Eric Minder, Scott Hacke (DLPC-Permits), Paul Takacs, Tim Murphy, Ken Corkill (BOA-RPMS), and Candy Morin (DWPC-Permits). Monsanto representatives present included Mr. Bob Hiller, Mr. Rick Hempel, and Ms. Dorothy Washington. Agency and Monsanto personnel divided into two groups, and site inspection resumed at approximately 10:30 a.m. As on the

previous day, each group photographed and filled out a SWMU Characterization Worksheet for each SWMU visited.

At the time of inspection, construction activities were being conducted at the site. During excavation, groundwater was discovered at approximately 4 feet below ground surface. The groundwater which flowed into the excavation was a yellow-green, opaque color, and evidently contaminated. This groundwater was pumped from the excavation into the facility sewer system. According to Monsanto representatives, the facility sewer system transports wastes off-site to a physical and chemical treatment plant. Effluent from the physical and chemical treatment plant is transported to the American Bottoms plant for treatment prior to NPDES permitted discharge into the Mississippi River.

Agency and Monsanto representatives ended the inspection at approximately 4:30 p.m. on August 6, 1992. None of the Areas of Concern identified in this RFA were visited during the Visual Site Inspection due to time restrictions. Monsanto representatives agreed to provide the Agency with additional SWMU characterization information not available at the time of the inspection, including information on underground storage tanks used at the facility.

V. Recommendations

Based upon the ranking system provided within Section IV above, the Agency recommends the following actions:

1. If a unit is ranked as a low priority for any particular environmental media, no environmental media investigations are warranted for that particular media. However, should media investigations being conducted at that unit indicate that an environmental media previously considered a low priority has been impacted, then investigations for that particular media should be conducted.
2. If a unit ranks as a medium priority for any environmental media (i.e., soil, groundwater or air), a comprehensive environmental media investigation should be conducted to determine the extent and character (if any) of impact to that particular environmental media.
3. If a unit ranks as a high priority for any environmental media, a comprehensive media investigation should be conducted to determine the extent and character of impact to that particular environmental media. Additionally, the facility should assess the potential for mitigating future releases from this unit based upon the information obtained from the media investigation.

Media investigations for soils should be comprised of a detailed sampling and analytical program which is capable of determining the horizontal and vertical extent (if any) of contamination as a result of operations of the unit.

Media investigations for groundwater should be comprised of a detailed monitoring program, which includes installation of a unit or area specific groundwater well system and a sampling and analytical program, which is capable of detecting and determining the rate of migration and horizontal and vertical extent of a contamination plume which is the result of operations of the unit.

Media investigations for air should be comprised of a detailed sampling and analytical program which is capable of determining the rate and extent (if any) of emissions from units as a result of operations.

All media investigations should be conducted with the objective of determining a corrective measures plan which will effectively stabilize or abate releases to impacted environmental media. A list of all SWMUs and their respective ranking is provided as Table 2 to this document.

In addition, all AOCs must be investigated by Monsanto to determine if they are Solid Waste Management Units. Once

1631210006 - St. Clair County
RFA

Monsanto
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sufficient information is provided by Monsanto to make this determination for each AOC, then (1) if the information indicates that the AOC is a SWMU, Monsanto will be required to conduct an RFI for that unit, or (2) if the information indicates that that AOC is not a SWMU, then no RFI will be required for that AOC.

Table 1

060412

Table 1

Identification of Hazardous Wastes Managed
Monsanto W.G. Krummerich Plant

<u>EPA Hazardous Waste Code</u>	<u>Process Code</u>	<u>Description of Waste</u>
D001	S01	Ignitable wastes in accordance with 35 IAC 721.121
D002	S01	Corrosive wastes in accordance with 35 IAC 721.122
D003	S01	Reactive wastes in accordance with 35 IAC 721.123
D007	S01	Toxic wastes due to concentrations of the parameter chromium
D008	S01	Toxic waste due to concentrations of the parameter lead
D009	S01	Toxic waste due to concentration of the parameter mercury
D010	S01	Toxic waste due to concentrations of the parameter selenium
D018	S01, T01	Toxic waste due to concentrations of the parameter benzene
D021	S01, S02	Toxic waste due to concentrations of the parameter chlorobenzene
D022	S01	Toxic waste due to concentrations of the parameter chloroform
D027	S01	Toxic waste due to concentrations of the parameter 1,4-dichloro- benzene

000413

<u>EPA Hazardous Waste Code</u>	<u>Process Code</u>	<u>Description of Waste</u>
D035	S01, S02	Toxic waste due to concentrations of the parameter methyl ethyl ketone
D036	S01, S02	Toxic waste due to concentrations of the parameter nitrobenzene
D037	S01	Toxic waste due to concentrations of the parameter pentachlorophenol
D038	S01	Toxic waste due to concentrations of the parameter pyridine
D041	S01	Toxic waste due to concentrations of the parameter 2,4,5-trichlorophenol
D042	S01	Toxic waste due to concentrations of the parameter 2,4,6-trichlorophenol
F001	S01	The following spent halogenated solvents used in degreasing: tetrachloroethylene, trichloroethylene, methylene chloride, 1,1,1-trichloroethane, carbon tetrachloride, and chlorinated fluorocarbons; all spent solvent mixtures and blends used in degreasing containing before use, a total of ten percent of more (by volume) of one or more of the above halogenated solvents or those solvents listed in F002, F004 or F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures.

EPA Hazardous Waste Code	Process Code	Description of Waste
F002	S01	The following spent halogenated solvents: tetrachloroethylene, methylene chloride, trichloroethylene, 1,1,1-trichloroethane, chlorobenzene, 1,1,2-trichloro-1,2,2-trifluoroethane, orthodichlorobenzene, trichlorofluoromethane; and 1,1,2-trichloroethane; all spent solvent mixtures and blends containing, before use, a total of ten percent or more (by volume) of one or more of the above halogenated solvents or those solvents listed in F001, F004, or F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures.
F003	S01	The following spent non-halogenated solvents; xylene, acetone, ethyl acetate, ethyl benzene, ethyl ether, methyl isobutyl ketone, n-butyl alcohol, cyclohexanone, and methanol; all spent solvent mixtures and blends containing, before use, only the above spent non-halogenated solvents; and all spent solvent mixtures and blends containing before use, one or more of the above non-halogenated solvents and a total of ten percent or more (by volume) of one or more of those solvents listed in F001, F002, F004 or F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures.

EPA Hazardous Waste Code	Process Code	Description of Waste
F005	S01	The following spent non-halogenated solvents: cresols and cresylic acid, and nitbenzene; all spent solvent mixtures and blends containing, before use, a total of ten percent or more (by volume) of one or more of the above non-halogenated solvents or those solvents listed in F001, F002, or F004; and still bottoms from the recovery of these spent solvents and spent solvent mixtures.
F020	S01	Wastes (except waste water and spent carbon from hydrogen chloride purification) from the production or manufacturing use (as a reactant, chemical intermediate, or component in a formulating process) of tri, or tetrachlorophenol, or of intermediates used to produce their pesticide derivatives. (This listing does not include wastes from the production of Hexachlorophene from highly purified 2,4,5-trichlorophenol).
F021	S01	Wastes (except wastewater and spent carbon from hydrogen chloride purification) from the production or manufacturing use (as a reactant, chemical intermediate or component in a formulating process) of pentachlorophenol, or intermediates used to produce its derivatives.

<u>EPA Hazardous Waste Code</u>	<u>Process Code</u>	<u>Description of Waste</u>
K085	S01	Distillation of fractionation column bottoms from the production of chlorobenzenes.
P077	S01	Benzineamine, 4-nitro
U012	S01	Aniline
U019	S01	Benzene
U037	S01	Chlorobenzene
U070	S01	o-Dichlorobenzene
U071	S01	m-Dichlorobenzene
U072	S01	p-Dichlorobenzene
U123	S01	Formic Acid
U159	S01	Methyl Ethyl Ketone
U161	S01	Methyl Isobutyl Ketone
U189	S01	Phosphorus sulfide
U196	S01	Pyridine
U239	S01	Xylene

Table 2

001413

Table 2
List of SWMUs and Recommendations
Monsanto Chemical Company
Sauget, Illinois

<u>SWMU No.</u>	<u>Unit Description</u>	<u>Recommendation</u>
1	Tank Unit	soil investigation
2	Tank Unit	soil investigation
3	Tank Unit	soil investigation
4	Wastewater Treatment	soil investigation
5	Tank Unit	soil investigation
6	Tank Unit	soil investigation groundwater investigation
7	Container Storage	soil investigation
8	Tank Unit	soil investigation
9	Container Storage	soil investigation
10	Tank Unit	soil investigation
11	Container Storage	soil investigation
12	Container Storage	soil investigation
13	Container Storage	soil investigation
14	Container Storage	soil investigation
15	Tank Unit	soil investigation
16	Tank Unit	no further investigations
17	Tank Unit	no further investigations
18	Waste Pile	groundwater investigation
19	Land Disposal	soil investigation groundwater investigation
20	Land Disposal	soil investigation groundwater investigation
21	Container Storage	soil investigation

00110

<u>SWMU No.</u>	<u>Unit Description</u>	<u>Recommendation</u>
22	Land Disposal	soil investigation groundwater investigation
23	Tank Unit	no further investigations
24	Land Disposal	soil investigation groundwater investigation
25	Land Disposal	soil investigation groundwater investigation
26	Land Disposal	soil investigation groundwater investigation
27	Land Disposal	soil investigation groundwater investigation
28	Land Disposal	soil investigation groundwater investigation
29	Land Disposal	soil investigation groundwater investigation
30	Land Disposal	soil investigation groundwater investigation
31	Land Disposal	soil investigation groundwater investigation
32	Incinerator	soil investigation
33	Tank Storage	soil investigation
34	Tank Storage	soil investigation
35	Container Storage	soil investigation
36	Wastewater Treatment	soil investigation
37	Tank Storage	soil investigation
38	Tank Storage	soil investigation air investigation
39	Container Storage	soil investigation
40	Container Storage	soil investigation
41	Land Disposal	soil investigation groundwater investigation

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<u>SWMU No.</u>	<u>Unit Description</u>	<u>Recommendation</u>
42	Container Storage	soil investigation
43	Wastewater Transport	soil investigation air investigation
44	Container Storage	soil investigation
45	Land Disposal	soil investigation groundwater investigation
46	Land Disposal	soil investigation groundwater investigation
47	Wastewater Treatment	soil investigation
48	Wastewater Treatment	soil investigation air investigation
49	Wastewater Treatment	soil investigation
50	Land Disposal	soil investigation groundwater investigation
51	Land Disposal	soil investigation groundwater investigation
52	Land Disposal	soil investigation groundwater investigation
53	Land Disposal	soil investigation groundwater investigation
54	Misc. Unit	soil investigation
55	Misc. Unit	soil investigation air investigation
56	Container Storage	soil investigation air investigation
57	Misc. Unit	soil investigation air investigation
58	Misc. Unit	soil investigation air investigation
59	Storage Tank	soil investigation groundwater investigation air investigation

000401

<u>SWMU No.</u>	<u>Unit Description</u>	<u>Recommendation</u>
60	Waste Pile	soil investigation
61	Land Disposal	soil investigation groundwater investigation
62	Misc. Unit	soil investigation
63	Misc. Unit	soil investigation air investigation
64	Misc. Unit	soil investigation air investigation
65	Wastewater Treatment	soil investigation air investigation
66	Wastewater Transport	soil investigation groundwater investigation
67	Wastewater Treatment	soil investigation
68	Wastewater Treatment	soil investigation air investigation
69	Container Storage	soil investigation

000422

1631210006 - St. Clair County
RFA

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References

IEPA Bureau of Land Files for the Monsanto Chemical Company
IEPA Bureau of Water Files for the Monsanto Chemical Company
IEPA Bureau of Air Files for the Monsanto Chemical Company
ISGS Well Logs
ISWS Private Well Database
USGS 1974 7.5 Minute Quadrangle Map, Cahokia Quadrangle
June 1991 Monsanto Chemical Company RCRA Part B Permit
Application

Table 3

104300

Table 3
Summary of RCRA Part A Application Revisions
Monsanto Chemical Company
Sauget, Illinois

<u>Submission</u>	<u>Date</u>	<u>Summary</u>
Original Submission	11/19/80	S01 200,000 G S02 950,000 G S03 40 Y T01 400 G T03 2 T T04 9,000 G Identified waste codes
Revision 1	9/25/84	Revised the following: S02 5,000 G T03 deleted Revised waste codes
Revision 2	12/6/84	Revised the following: S01 400,000 G
Revision 3	5/15/85	Revised the following: S02 13,000 G S03 deleted S01 40 Y Revised waste codes
Revision 4	6/10/85	Revised waste codes
Revision 5	8/8/86	Revised waste codes
Revision 6	6/1/90	Revised the following: T01 deleted T04 deleted
Revision 7	9/24/90	Revised the following: T01 6,000 Y S02 8,000 G
Revision 8	6/26/91	Revised waste codes

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Table 4

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Table 4
W.G. Krummerich Facility Air and Water Permits
Monsanto Chemical Company
Sauget, Illinois

Bureau of Water

<u>Permit Number</u>	<u>Expiration Date</u>	<u>Description</u>
1990-EN-0928	N/A	Permit to Construct; Pre-treatment of OCPSF Wastewater; discharge to American Bottoms WWTF
1990-EN-0927	N/A	Permit to Construct; Pre-treatment of OCPSF Wastewater; discharge to American Bottoms WWTF

Bureau of Air

<u>Permit Number</u>	<u>Expiration Date</u>	<u>Description</u>
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Due to space constraints, a complete list of air permits for the Monsanto W. G. Krummerich facility will not be listed in this document. To obtain a complete list of all air permits, please contact the Agency's Bureau of Air.

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Table 5

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Table 3. Summary of Volatile Organic Compounds in Ground Water, Former Chlor-Alkali Storage Pad, Monsanto Company, Sauget, Illinois.

Well Number:	CA-1	CA-2	CA-3	CA-3*	CA-4	GM12A	TRIP
Date:	12/89	12/89	12/89	12/89	12/89	12/89	BLANK
Laboratory:	ETC	ETC	ETC	ETC	ETC	ETC	ETC
USEPA Appendix IX Volatile Organic Compounds (concentrations are in ug/L)							
Acetonitrile	<1500	<1500	<15	<15	<1500	<15	<15
Acrolein	<2000	<2000	<20	<20	<2000	<20	<20
Acrylonitrile	<1000	<1000	<10	<10	<1000	<10	<10
1,4-Dioxane	<30000	<30000	<300	<300	<30000	<300	<300
Ethyl cyanide	<4000	<4000	<40	<40	<4000	<40	<40
Isobutyl alcohol	<23000	<23000	<230	<230	<23000	<230	<230
Methacrylonitrile	<11000	<11000	<110	<110	<11000	<110	<110
Benzene	6,050	5,400	29.2	29.1	3,160	4,940	<4.4
Methyl bromide	<1000	<1000	<10	<10	<500	<500	<10
Carbon disulfide	<1000	<1000	<10	<10	<500	<500	<10
Chloroethane	<1000	<1000	<10	<10	<500	<500	<10
Chlorobenzene	<600	<600	173	165	465	<300	<6.0
Chloroform	<160	<160	1.6	1.6	<80	<80	<1.6
Methyl chlor	<1000	<1000	<10	<10	<500	<500	<10
3-chloropropene	<1000	<1000	<10	<10	<500	<500	<10
1,2-Dibromo-3-chloropropane	<1000	<1000	<10	<10	<500	<500	<10
1,2-Dibromoethane	<1000	<1000	<10	<10	<500	<500	<10
Dibromomethane	<1000	<1000	<10	<10	<500	<500	<10
1,4-Dichloro-2-butene	<1000	<1000	<10	<10	<500	<500	<10
Dichlorodifluoromethane	<1000	<1000	<10	<10	<500	<500	<10
1,1-Dichloroethane	<470	<470	<4.7	<4.7	<240	<240	<4.7
1,2-Dichloroethane	<280	<280	<2.8	<2.8	<140	<140	<2.8
1,2-trans-Dichloroethylene	<160	<160	<1.6	<1.6	<80	<80	<1.6
1,1-Dichloroethylene	<280	<280	<2.8	<2.8	<140	<140	<2.8
Methylene chloride	667	1,660	15.6	5.16	366	212	7.38
1,2-Dichloropropane	<600	<600	<6.0	<6.0	<300	<300	<6.0
cis-1,3-Dichloropropylene	<500	<500	<5.0	<5.0	<250	<250	<5.0
trans-1,3-Dichloropropylene	<1000	<1000	<10	<10	<500	<500	<10
Chlorodibromomethane	<310	<310	<3.1	<3.1	<160	<160	<3.1
Dichlorobromomethane	<220	<220	<2.2	<2.2	<110	<110	<2.2
Ethyl methacrylate	<1000	<1000	<10	<10	<500	<500	<10
Iodomethane	<1000	<1000	<10	<10	<500	<500	<10
Methyl ethyl ketone	<1000	<1000	<10	<10	<500	<500	<10
Methyl methacrylate	<1000	<1000	<10	<10	<500	<500	<10
1,1,1,2-Tetrachloroethane	<1000	<1000	<10	<10	<500	<500	<10
1,1,2,2-Tetrachloroethane	<690	<690	<6.9	<6.9	<350	<350	<6.9
Tetrachloroethylene	<410	<410	<4.1	<4.1	<210	<210	<4.1

ug/L Microgram per liter.

Replicate Samples.

ETC Environmental Testing and Certification, Edison, New Jersey.

Table 3. Summary of Volatile Organic Compounds in Ground Water, Former Chlor-Alkali Storage Pad, Monsanto Company, Sauget, Illinois.

Well Number:	CA-1	CA-2	CA-3	CA-3*	CA-4	GM12A	TRIP
Date:	12/89	12/89	12/89	12/89	12/89	12/89	BLANK
Laboratory:	ETC	ETC	ETC	ETC	ETC	ETC	ETC
USEPA Appendix IX							
Volatile Organic Compounds							
(concentrations are in ug/L)							
Carbon tetrachloride	<280	<280	<2.8	<2.8	<140	<140	<2.8
Toluene	<600	<600	<6.0	<6.0	<300	<300	<6.0
Bromoform	<470	<470	<4.7	<4.7	<240	<240	<4.7
1,1,1-Trichloroethane	<380	<380	<3.8	<3.8	<190	<190	<3.8
1,1,2-Trichloroethane	<500	<500	<5.0	<5.0	<250	<250	<5.0
Trichloroethylene	<190	<190	<1.9	<1.9	<95	<95	<1.9
Trichlorofluoromethane	<1000	<1000	<10	<10	<500	<500	<10
1,2,3-Trichloropropane	<1000	<1000	<10	<10	<500	<500	<10
Vinyl chloride	<1000	<1000	<10	<10	<500	<500	<10
Acetone	<1000	<1000	<10	<10	<500	<500	<10
Ethylbenzene	<720	<720	<7.2	<7.2	<360	<360	<7.2
2-Hexanone	<1000	<1000	<10	<10	<500	<500	<10
Methyl-iso-butyl ketone	<1000	<1000	<10	<10	<500	<500	<10
Styrene	<1000	<1000	<10	<10	<500	<500	<10
Vinyl acetate	<1000	<1000	<10	<10	<500	<500	<10
m-Xylene	<1000	<1000	<10	<10	<500	<500	<10
o+p-Xylenes	<1000	<1000	<10	<10	<500	<500	<10

ug/L Microgram per liter.

* Replicate Samples.

ETC Environmental Testing and Certification, Edison, New Jersey.

Table 4. Summary of Semivolatile Organic Compounds in Ground Water, Former Chlor-Alkali Storage Pad,
Monsanto Company, Sauget, Illinois.

Well Number:	CA-1	CA-2	CA-3	CA-3*	CA-4	GM12A
Date:	12/89	12/89	12/89	12/89	12/89	12/89
Laboratory:	ETC	ETC	ETC	ETC	ETC	ETC
USEPA Appendix IX						
Semivolatile Organic Compounds						
(concentrations are in ug/L)						
Acetophenone	<11	<12	<11	<10	<12	<14
2-Acetylaminofluorene	<11	<12	<11	<10	<12	<14
4-Aminobiphenyl	<11	<12	<11	<10	<12	<14
Aniline	55.5	<12	<11	<10	<12	653
Aramite	<11	<12	<11	<10	<12	<14
Benzo(a)anthracene	<8.3	<9.2	<8.3	<8.0	<9.1	<11
Benzo(b)fluoranthene	<5.1	<5.6	<5.1	<4.9	<5.6	<6.8
Benzo(a)pyrene	<2.7	<2.9	<2.7	<2.6	<2.9	<3.5
bis(2-Chloroethoxy) methane	<5.6	<6.2	<5.6	<5.5	<6.2	<7.5
bis(2-Chloroethyl)ether	<6.1	<6.7	<6.1	<5.9	<6.6	<8.0
bis(2-Chloroisopropyl)ether	<6.1	<6.7	<6.1	<5.9	<6.6	<8.0
bis(2-Ethylhexyl)phthalate	<11	<12	<11	<10	20.6	<14
4-Bromophenyl phenyl ether	<2.0	<2.2	<2.0	<2.0	<2.2	<2.7
Butyl benzyl phthalate	<11	<12	<11	<10	<12	<14
2-sec-Butyl-4,6-dinitrophen	<11	<12	<11	<10	<12	<14
p-Chloroaniline	<11	<12	<11	<10	<12	<14
p-Chloro-m-cresol	<3.2	<3.5	<3.2	<3.1	<3.5	<4.2
2-Chloronaphthalene	<2.0	<2.2	<2.0	<2.0	<2.2	<2.7
2-Chlorophenol	117	122	<3.5	<3.4	62.7	15.2
Chrysene	<2.7	<2.9	<2.7	<2.6	<2.9	<3.5
Acenaphthene	<2.0	<2.2	<2.0	<2.0	<2.2	<2.7
Acenaphthylene	<3.7	<4.1	<3.7	<3.6	<4.1	<4.9
Anthracene	<2.0	<2.2	<2.0	<2.0	<2.2	<2.7
Benzo(ghi)perylene	<4.4	<4.8	<4.4	<4.2	<4.8	<5.8
Benzo(k)fluoranthene	<2.7	<2.9	<2.7	<2.6	<2.9	<3.5
Fluorene	<2.0	<2.2	<2.0	<2.0	<2.2	<2.7
Phenanthrene	<5.7	<6.4	<5.7	<5.6	<6.3	<7.6
Pyrene	<2.0	<2.2	<2.0	<2.0	<2.2	<2.7
2-Nitrophenol	<3.8	10,900	<3.8	<3.7	4,450	<5.1
o-Cresol	<11	<12	<11	<10	<12	<14
m+p-Cresols	59.7	<12	<11	<10	36.3	<14
Diallate	<11	<12	<11	<10	<12	<14
Dibenzo(a,h)anthracene	<11	<12	<11	<10	<12	<14
Di-n-butyl phthalate	<11	<12	<11	<10	<12	<14
1,2-Dichlorobenzene	1,220	11,200	2,060	2,180	5,680	69.6
1,3-Dichlorobenzene	5.54	3.87	3.72	3.70	5.66	<2.7
1,4-Dichlorobenzene	14.6	11.5	<4.7	<4.5	17.6	<6.2
3,3'-Dichlorobenzidine	<18	<19	<18	<17	<19	<23
2,4-Dichlorophenol	<2.9	<3.2	<2.9	<2.8	<3.1	<3.8
2,6-Dichlorophenol	<11	<12	<11	<10	<12	<14
Diethyl phthalate	<11	<12	<11	<10	<12	<14
p-Dimethylaminoazobenzene	<11	<12	<11	<10	<12	<14

ug/L Micrograms per liter.

* Replicate samples.

ETC Environmental Testing and Certification, Edison, New Jersey.

Table 4. Summary of Semivolatile Organic Compounds in Ground Water, Former Chlor-Alkali Storage Pad, Monsanto Company, Sauget, Illinois.

Well Number:	CA-1	CA-2	CA-3	CA-3*	CA-4	GM12A
Date:	12/89	12/89	12/89	12/89	12/89	12/89
Laobratory:	ETC	ETC	ETC	ETC	ETC	ETC
USEPA Appendix IX Semivolatile Organic Compounds (concentrations are in ug/L)						
7,12-Dimethylbenzo(a)anthracene	<11	<12	<11	<10	<12	<14
3,3'-Dimethylbenzidine	<11	<12	<11	<10	<12	<14
2,4-Dimethylphenol	<2.9	<3.2	<2.9	<2.8	<3.1	<3.8
Dimethyl phthalate	<11	<12	<11	<10	<12	<14
m-Dinitrobenzene	<11	<12	<11	<10	<12	<14
4,6-Dinitro-o-cresol	<26	<28	<26	<25	<28	<34
2,4-Dinitrophenol	<45	<49	<45	<43	<49	<59
2,4-Dinitrotoluene	<6.1	<6.7	<6.1	<5.9	<6.6	<8.0
2,6-Dinitrotoluene	<2.0	<2.2	<2.0	<2.0	<2.2	<2.7
Di-n-octyl phthalate	<11	<12	<11	<10	<12	<14
Diphenylamine	<11	<12	<11	<10	<12	<14
N-Nitrosodi-n-propylamine	<11	<12	<11	<10	<12	<14
Ethyl methanesulfonate	<11	<12	<11	<10	<12	<14
Fluoranthene	<2.3	<2.6	<2.3	<2.3	<2.6	<3.1
Hexachlorobenzene	<2.0	<2.2	<2.0	<2.0	<2.2	<2.7
Hexachlorobutadiene	<.96	<1.1	<.96	<.93	<1.0	<1.3
Hexachlorocyclopentadiene	<11	<12	<11	<10	<12	<14
Hexachloroethane	<1.7	<1.9	<1.7	<1.6	<1.9	<2.3
Isodrin	<6.3	<6.9	<6.3	<6.1	<6.9	<8.3
Hexachlorophene	<11	<12	<11	<10	<12	<14
Hexachloropropene	<11	<12	<11	<10	<12	<14
Indeno(1,2,3-c,d)pyrene	<5.0	<5.5	<5.0	<4.8	<5.5	<6.6
Isosafrole	<11	<12	<11	<10	<12	<14
3-Methylcholanthrene	<11	<12	<11	<10	<12	<14
Methyl methanesulfonate	<11	<12	<11	<10	<12	<14
Naphthalene	<1.7	<1.9	<1.7	<1.6	<1.9	<2.3
1,4-Naphthoquinone	<11	<12	<11	<10	<12	<14
1-Naphthylamine	<11	<12	<11	<10	<12	<14
2-Naphthylamine	<11	<12	<11	<10	<12	<14
p-Nitroaniline	<11	<12	<11	<10	<12	<14
Nitrobenzene	<2.0	215	2.57	<2.0	<2.2	<2.7
4-Nitrophenol	<2.6	134	<2.6	<2.5	<63.8	<3.4
N-Nitrosodiphenylamine	<2.0	<2.2	<2.0	<2.0	<2.2	<2.7
N-Nitrosodi-n-butylamine	<11	<12	<11	<10	<12	<14
N-Nitrosodiethylamine	<11	<12	<11	<10	<12	<14
N-Nitrosodimethylamine	<11	<12	<11	<10	<12	<14
N-Nitrosomethylethylamine	<11	<12	<11	<10	<12	<14
N-Nitrosomorpholine	<11	<12	<11	<10	<12	<14
N-Nitrosopiperidine	<11	<12	<11	<10	<12	<14

ug/L Micrograms per liter.

* - Replicate samples.

ETC Environmental Testing and Certification, Edison, New Jersey.

Table 4. Summary of Semivolatile Organic Compounds in Ground Water, Former Chlor-Alkali Storage Pad, Monsanto Company, Sauget, Illinois.

Well Number:	CA-1	CA-2	CA-3	CA-3*	CA-4	GM12A
Date:	12/89	12/89	12/89	12/89	12/89	12/89
Laobratory:	ETC	ETC	ETC	ETC	ETC	ETC
USEPA Appendix IX Semivolatile Organic Compounds (concentrations are in ug/L)						
5-Nitro-o-toluidine	<11	<12	<11	<10	<12	<14
Pentachlorobenzene	<11	<12	<11	<10	<12	<14
Pentachloronitrobenzene	<11	<12	<11	<10	<12	<14
Pentachlorophenol	<3.8	<4.2	<3.8	<3.7	<4.2	<5.1
Phenacetin	<11	<12	<11	<10	<12	<14
Phenol	117	2,050	<1.6	<1.5	359	139
m-phenylenediamine	<11	<12	<11	<10	<12	<14
o-phenylenediamine	<11	<12	<11	<10	<12	<14
p-phenylenediamine	<11	<12	<11	<10	<12	<14
2-Picoline	<11	<12	<11	<10	<12	<14
Pronamide	<11	<12	<11	<10	<12	<14
Pyridine	<85	<94	<85	<82	<93	NA
Safrole	<11	<12	<11	<10	<12	<14
1,2,4,5-Tetrachlorobenzene	<11	<12	<11	<10	<12	<14
2,3,4,6-Tetrachlorophenol	<11	<12	<11	<10	<12	<14
o-Toluidine	290	<12	<11	<10	44.1	<14
1,2,4-Trichlorobenzene	21.9	31.9	61.0	68.2	53.6	<2.7
2,4,5-Trichlorophenol	<11	<12	<11	<10	<12	<14
2,4,6-Trichlorophenol	3.66	<3.2	<2.9	<2.8	<3.1	<3.8
Benzyl alcohol	<11	<12	<11	<10	<12	<14
Dibenzofuran	<11	<12	<11	<10	<12	<14
Isophorone	<2.3	<2.6	<2.3	<2.3	<2.6	<3.1
2-Methylnaphthalene	<11	<12	<11	<10	<12	<14
o-Nitroaniline	<11	42.1	<11	<10	<12	<14
m-Nitroaniline	<11	<12	<11	<10	<12	<14
4-Chlorophenyl phenyl ether	<4.5	<4.9	<4.5	<4.3	<4.9	<5.9

ug/L Micrograms per liter.

* Replicate samples.

ETC Environmental Testing and Certification, Edison, New Jersey.

NA Not analyzed.

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Table 5. Summary of Pesticide and PCB Compounds in Ground Water, Former Chlor-Alkali Storage Pad, Monsanto Company, Sauget, Illinois.

Well Number:	CA-1	CA-2	CA-3	CA-3*	CA-4	GM12A
Date:	12/89	12/89	12/89	12/89	12/89	12/89
Laboratory:	ETC	ETC	ETC	ETC	ETC	ETC
USEPA Appendix IX Pesticide and PCB Compounds (concentrations are in ug/L)						
Aldrin	<0.51	<0.51	<0.51	<0.52	<0.062	<0.059
Chlordane	<10	<10	<10	<10	<1.2	<1.2
Chlorobenzilate	<25	<26	<25	<26	<3.1	<2.9
4,4'-DDD	<1.0	<1.0	<1.0	<1.0	<0.12	<0.12
4,4'-DDE	<1.0	<1.0	<1.0	<1.0	<0.12	<0.12
4,4'-DDT	<1.0	<1.0	<1.0	<1.0	<0.12	<0.12
Dieldrin	<1.0	<1.0	3.45	3.49	<0.12	<0.12
Endosulfan I	<0.51	<0.51	<0.51	<0.52	<0.062	<0.059
Endosulfan II	<1.0	<1.0	<1.0	<1.0	<0.12	<0.12
Endosulfan sulfate	<1.0	<1.0	<1.0	<1.0	<0.12	<0.12
Endrin	<1.0	<1.0	<1.0	<1.0	<0.12	<0.12
Endrin aldehyde	<1.0	<1.0	<1.0	<1.0	<0.12	<0.12
Heptachlor	<0.51	<0.51	<0.51	<0.52	<0.062	<0.059
Heptachlor epoxide	<0.51	<0.51	<0.51	<0.52	<0.062	<0.059
Alpha-BHC	<0.51	<0.51	<0.51	<0.52	<0.062	<0.059
Beta-BHC	<0.51	<0.51	<0.51	<0.52	<0.062	<0.059
Gamma-BHC	<0.51	<0.51	<0.51	<0.52	<0.062	<0.059
Delta-BHC	<0.51	<0.51	<0.51	<0.52	<0.062	<0.059
Kepon	<5.1	<5.1	<5.1	<5.2	<0.62	<0.59
Methoxychlor	<5.1	<5.1	<5.1	<5.2	<0.62	<0.59
Toxaphene	<20	<20	<20	<21	<2.5	<2.4
Aroclor 1016	<5.1	<5.1	<5.1	<5.2	<0.62	<0.059
Aroclor 1221	<5.1	<5.1	<5.1	<5.2	<0.62	<0.059
Aroclor 1232	<5.1	<5.1	<5.1	<5.2	<0.62	<0.059
Aroclor 1242	<5.1	<5.1	408	421	<0.62	<0.059
Aroclor 1248	<5.1	<5.1	<5.1	<5.2	<0.62	<0.059
Aroclor 1254	<10	<10	<10	<10	<1.2	<1.2
Aroclor 1260	<10	<10	<10	<10	<1.2	<1.2
Thionazin	<1.0	<1.0	<1.0	<1.0	<1.2	<1.2
Dimethoate	<2.5	<2.6	<2.5	<2.6	<3.1	<2.9
Disulfoton	<0.51	<0.51	<0.51	<0.52	<0.62	<0.59
Methyl parathion	<1.0	<1.0	<1.0	<1.0	<1.2	<1.2
Parathion	<1.0	<1.0	<1.0	<1.0	<1.2	<1.2
Phorate	<2.5	<2.6	<2.5	<2.6	<3.1	<2.9
Famphur	<10	<10	<10	<10	<12	<12
2,4-D	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
2,4,5-T	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
2,4,5-TP (Silvex)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0

ug/L Micrograms per liter.

* Replicate Samples.

ETC Environmental Testing and Certification, Edison, New Jersey.

Table 6. Summary of Metals and Miscellaneous Parameters in Ground Water, Former Chlor-Alkali Storage Pad, Monsanto Company, Sauget, Illinois.

Well Number:	CA-1	CA-2	CA-3	CA-3*	CA-4	GM12A
Date:	12/89	12/89	12/89	12/89	12/89	12/89
Laboratory:	ETC	ETC	ETC	ETC	ETC	ETC
USEPA Appendix IX Metals and Miscellaneous Parameters (concentrations are in ug/L)						
Antimony	<60	<60	<60	<60	<60	<60
Arsenic	100	<10	<10	<10	<10	<10
Barium	250	110	140	180	180	100
Beryllium	<1.0	<1.0	1.3	<1.0	<1.0	<1.0
Cadmium	<2.0	2.1	7.8	9.3	<2.0	<2.0
Chromium	11	<10	<10	11	<10	<10
Cobalt	<20	<20	<20	<20	<20	<20
Copper	<10	12	21	17	11	<10
Lead	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Mercury	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Nickel	34	48	52	48	42	<20
Selenium	<5.0	<5.0	<25	<25	<5.0	<5.0
Silver	<10	<10	10	15	<10	98
Thallium	<10	<10	<10	<10	<10	<10
Tin	<50	<50	<50	<50	<50	<50
Vanadium	<20	<20	39	42	<20	<20
Zinc	23	56	43	170	41	67
Cyanide, Total	0.0147	<0.0100	<0.0100	<0.0100	0.0127	<0.0100
Sulfide as S	0.37	0.78	0.27	0.24	0.21	0.19
Ph (standard units)	7.0	6.6	6.8	6.8	6.9	7.6
Specific Conductance (uhms/cm)	5500	6000	7000	7000	5750	5000
Temperature (degree C)	NA	15	14	14	13	14

* Replicate samples.

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